Dell™ XPS™ 630i
Service Manual

Model DCDR01

Notes, Notices, and Cautions

NOTE: A NOTE indicates important information that helps you make better use of your computer.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

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Model DCDR01

February 2008 **Rev. A00**

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1

Before You Begin

This document provides procedures for removing and installing the components in your computer. Unless otherwise noted, each procedure assumes that the following conditions exist:

- You have performed the steps in "Turning Off Your Computer" on page 9 and "Before Working Inside Your Computer" on page 10.
- You have read the safety information in the Dell™ *Product Information Guide*.
- A component can be replaced or—if purchased separately—installed by performing the removal procedure in reverse order.

Recommended Tools

The procedures in this document may require the following tools:

- Small Phillips screwdriver
- Flash BIOS update program media

Turning Off Your Computer

NOTICE: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.

1. Shut down the operating system:
   a. Save and close all open files and exit all open programs.
   b. *In the Microsoft® Windows® XP operating system*, click **Start→Shut Down→Shut down**.

In the Microsoft Windows Vista® operating system, click the Windows Vista Start button , click the arrow in the lower-right corner of the Start menu as shown below, and then click **Shut Down**.

The computer turns off after the operating system shutdown process is complete.

2 Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 4 seconds to turn them off.

Before Working Inside Your Computer

Use the following safety guidelines to help protect your computer from potential damage and to help to ensure your own personal safety.

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

NOTICE: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

NOTICE: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

NOTICE: To avoid damaging the computer, perform the following steps before you begin working inside the computer.

1 Ensure that the work surface is flat and clean to prevent the computer cover from being scratched.

2 Turn off your computer (see "Turning Off Your Computer" on page 9).

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

3. Disconnect all telephone or network cables from the computer.
4. Disconnect your computer and all attached devices from their electrical outlets.
5. Press the power button to ground the system board.

NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

2

Removing the Computer Cover

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

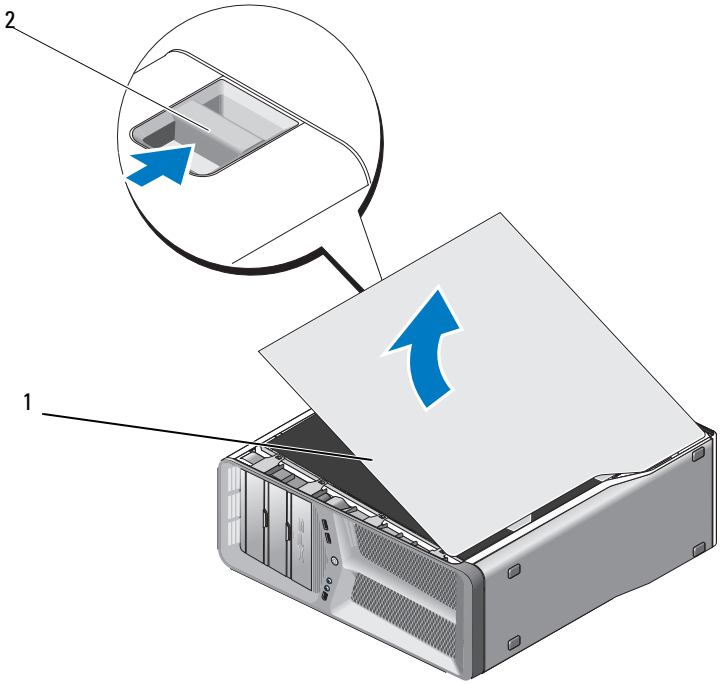
CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

NOTICE: To avoid electrostatic discharge and damage to internal components, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "Before Working Inside Your Computer" on page 10.

NOTICE: Ensure that sufficient space exists to support the system with the cover removed—at least 30 cm (1 ft) of desktop space.

2. Pull back on the cover release latch located at the top-rear of the computer.



1	computer cover	2	cover release latch

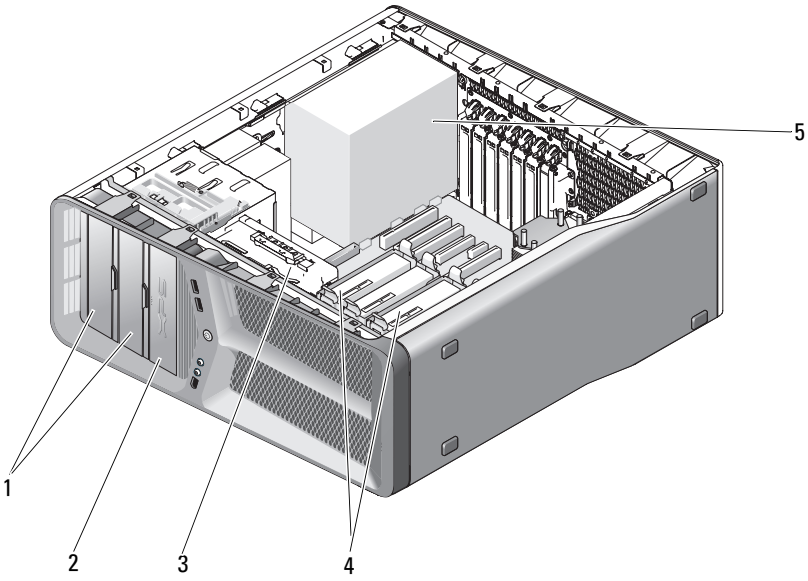
3 With the cover release latch pulled back, grip the sides of the cover, then pivot the top of the cover up and away from the computer.

4 Slide the cover forward and then upward to remove it from the hinge slots. Set it aside in a secure and protected location.

3

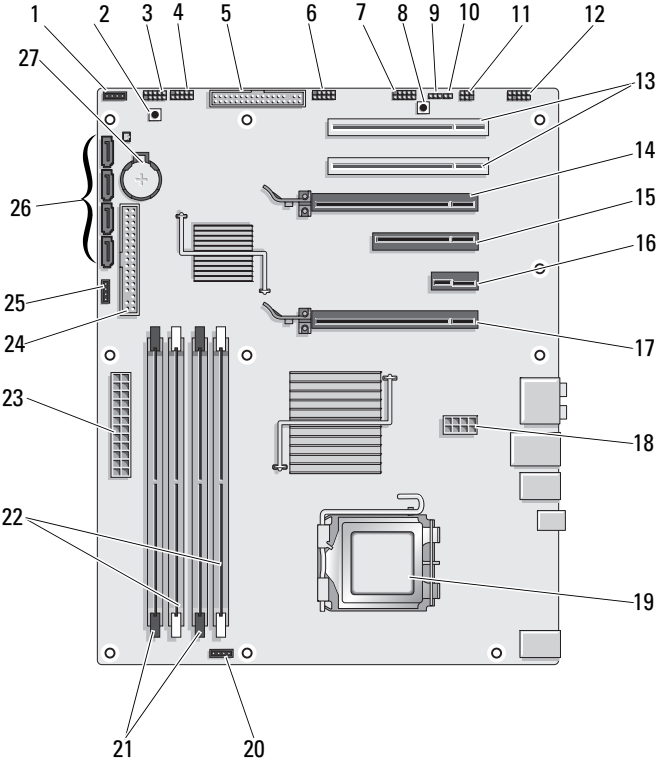
Technical Overview

Inside View of Your Computer



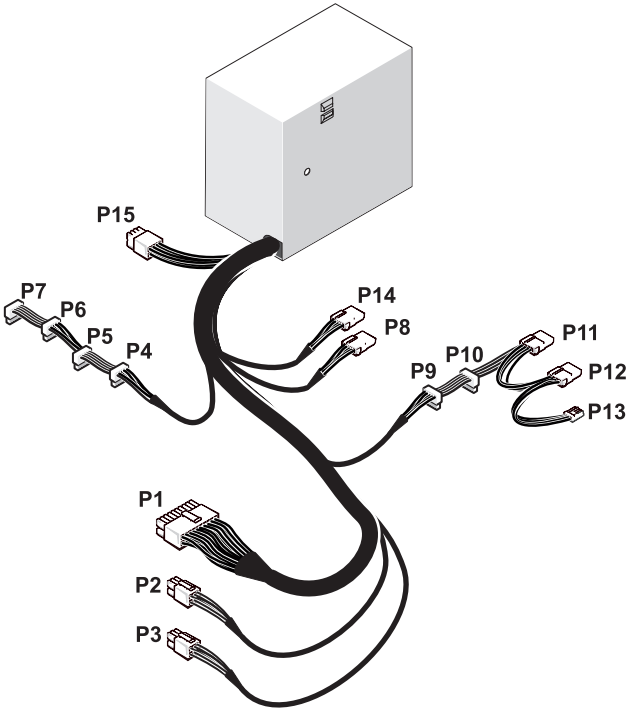
1	CD/DVD drive bays (2)	2	floppy drive/media card reader
3	card fan	4	hard-drive bays (4)
5	power supply		

System Board Components

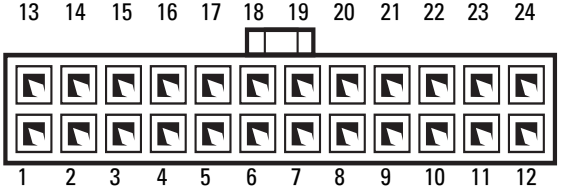


1	unused fan connector	2	power button (POWER_BTN)
3	front LED	4	front panel USB connector (FP_USB)
5	floppy drive (DSKT)	6	master I/O board USB connector (MIO_USB)
7	front panel IEEE connector (FP_1394)	8	reset button (RESET_BUTTON)
9	RTC reset jumper (CLEAR_ CMOS)	10	password jumper (CLEAR_PASSWORD)
11	internal S/PDIF connector (internal SPDIF)	12	front panel audio (FP_AUDIO)
13	PCI card slot (SLOT5 and SLOT6)	14	PCI-Express x16 card slot (SECONDARY GFX SLOT4)
15	PCI-Express x8 card slot (SLOT3)	16	PCI-Express x1 card slot (SLOT2) **NOTE:** This slot is not available in the dual-graphics configuration
17	PCI-Express x16 card slot (PRIMARY_GFX_SLOT1)	18	power connector (12V_ATXP)
19	processor (CPU)	20	processor fan connector (FAN_CPU)
21	*black* memory module connectors (DIMM2 and DIMM 3)	22	*white* memory module connectors (DIMM0 and DIMM1)
23	main power connector (POWER)	24	IDE drive connector (IDE)
25	North bridge fan connector	26	SATA connectors (SATA0-3)
27	battery socket (BATTERY)		

Power Supply Unit (PSU) DC Connector Pin Assignments

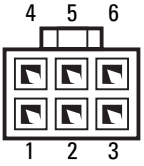


DC Power Connector P1



Pin Number	Signal name	18-AWG Wire Color
1	+3.3 VDC	Orange
2	+3.3 VDC/SE	Orange
3	COM	Black
4	+5 VDC	Red
5	COM	Black
6	+5 VDC	Red
7	COM	Black
8	POK	Gray
9	+5 VFP	Purple
10	+12 VD DC/SE	Yellow/White
11	+12 VD DC	Yellow/White
12	+3.3 VDC	Orange
13	+3.3 VDC	Orange
14	-12 VDC	Blue
15	COM	Black
16	PS_ON	Green
17	COM	Black
18	COM	Black
19	COM	Black
20	N/C	N/A
21	+5 VDC/SE	Red
22	+5 VDC	Red
23	+5 VDC	Red
24	COM	Black

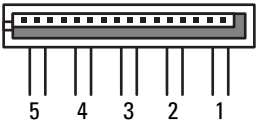
DC Power Connector P2 and P3 (Graphics Card)



Pin Number	Signal name	18-AWG Wire Color
1	+12 VB DC	White
2	+12 VB DC	White
3	+12 VB DC	White
4	COM	Black
5	COM	Black
6	COM	Black

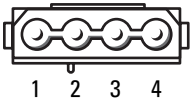
NOTE: The P2 and P3 connectors are intended for use with the PCI Express graphics cards whose power requirements exceed 75 watts.

DC Power Connectors P4–P7 (HDD0–HDD3)



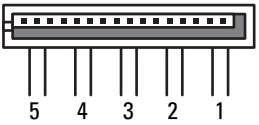
Pin Number	Signal name	18-AWG Wire Color
1	+3.3 VDC	Orange
2	COM	Black
3	+5 VDC	Red
4	COM	Black
5	+12 VB DC	White

DC Power Connector P8 (PHY)



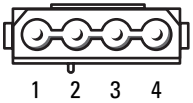
Pin Number	Signal name	18-AWG Wire Color
1	+12 VB DC	White
2	COM	Black
3	COM	Black
4	+5 VDC	Red

DC Power Connectors P9 and P10 (Bay1 SATA and Bay2 SATA)



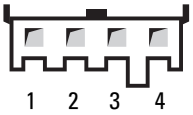
Pin Number	Signal name	18-AWG Wire Color
1	+3.3 VDC	Orange
2	COM	Black
3	+5 VDC	Red
4	COM	Black
5	+12 VC DC	Blue/White

DC Power Connector P11 and P12 (BAY and BAY2)



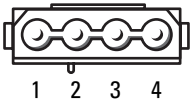
Pin Number	Signal name	18-AWG Wire Color
1	+12 VB DC	White
2	COM	Black
3	COM	Black
4	+5 VDC	Red

DC Power Connector P13 (FDI)



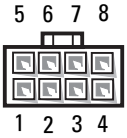
Pin Number	Signal name	22-AWG Wire Color
1	+5 VDC	Red
2	COM	Black
3	COM	Black
4	+12 VB DC	White

DC Power Connector P14 (MS BD)



Pin Number	Signal name	18-AWG Wire Color
1	+12 VB DC	White
2	COM	Black
3	COM	Black
4	+5 VDC	Red

DC Power Connectors P15



Pin Number	Signal name	16-AWG Wire Color
1	COM	Black
2	COM	Black
3	COM	Black
4	COM	Black
5	+12 VDC	Yellow
6	+12 VDC	Yellow
7	+12 VDC	Green/Yellow
8	+12 VDC	Green/Yellow

Power Button DC Pin Assignments

Pin Number	Signal name
1	+5 VDC
2	PC LED
3	Hard-drive LED
4	Ground
5	Cable detect
6	PWRBTN **NOTE:** The PWRBTN signal is inverted.
7	N/A
8	Ground
9	N/A
10	Key

4

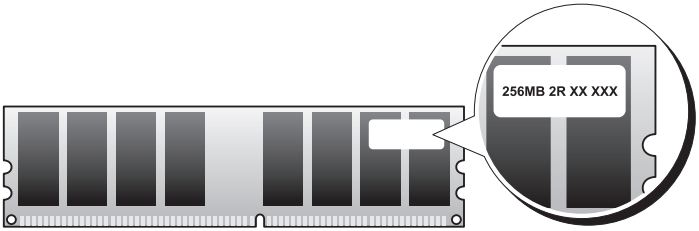
Memory

You can increase your computer memory by installing memory modules on the system board.

Your computer supports DDR2 memory. For additional information on the type of memory supported by your computer, see "Specifications" in the *Owner's Manual*.

DDR2 Memory Overview

- DDR2 memory modules should be installed in *pairs of matched memory size and speed*. If the DDR2 memory modules are not installed in matched pairs, the computer will continue to operate, but with a slight reduction in performance. See the label on the upper-right or upper-left corner of the module to determine the module's capacity.



NOTE: Always install DDR2 memory modules in the order indicated on the system board.

The recommended memory configurations are:

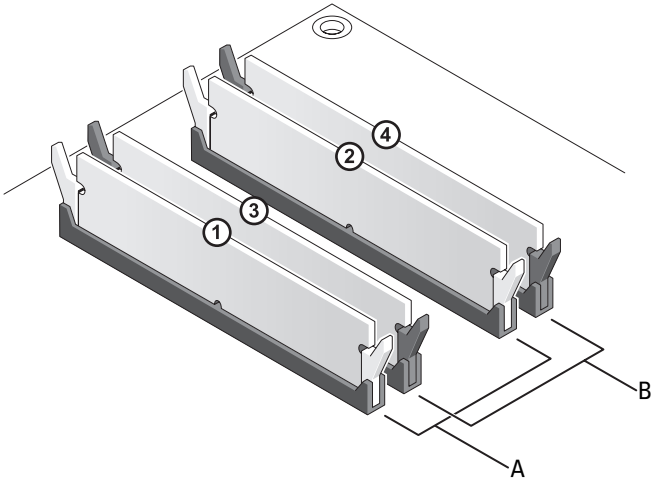
– A pair of matched memory modules installed in DIMM connectors 1 and 2

or

– A pair of matched memory modules installed in DIMM connectors 1 and 2 and another matched pair installed in DIMM connectors 3 and 4

NOTICE: Do not install ECC memory modules.

- If you install mixed pairs of PC2-4300 (DDR2 533-MHz) and PC2-5300 (DDR2 667-MHz) memory, the modules function at the speed of the slowest module installed.
- Ensure that you install a single memory module in DIMM connector 1, the connector closest to the processor, before you install modules in any other connector.



A matched pair of modules in DIMM connectors 1 and 2 (white securing clips)

B matched pair of memory modules in DIMM connectors 3 and 4 (black securing clips)

NOTICE: If you remove your original memory modules from the computer during a memory upgrade, keep them separate from any new modules that you may have, even if you purchased the new modules from Dell. If possible, do not pair an original memory module with a new memory module. Otherwise, your computer may not start properly. You should install your original memory modules in pairs either in DIMM connectors 1 and 2 or DIMM connectors 3 and 4.

NOTE: Memory purchased from Dell is covered under your computer warranty.

Addressing Memory Configurations

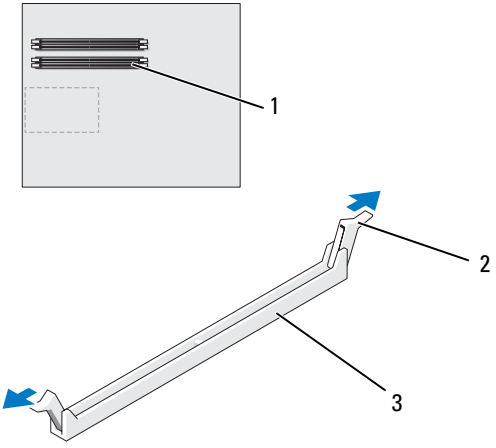
If you are using a 32-bit operating system such as Microsoft® Windows® XP, your computer will support a maximum of 4 GB of memory. If you are using a 64-bit operating system, your computer will support a maximum of 8 GB (2-GB DIMMs in each of the four slots) of memory.

Installing Memory

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

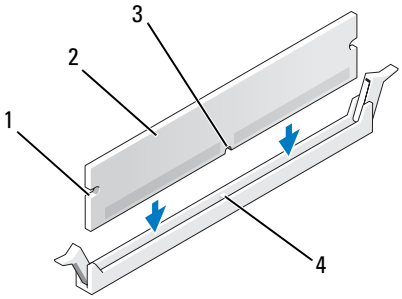
NOTICE: To avoid electrostatic discharge and damage to internal components, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Press out the securing clip at each end of the memory module connector.



1	memory connector closest to processor	2	securing clips (2)	3	memory connector

4 Align the notch on the bottom of the module with the crossbar in the connector.

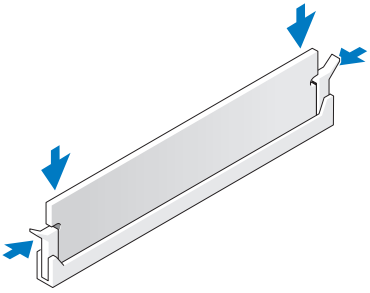


1	cutouts (2)	2	memory module
3	notch	4	crossbar

NOTICE: To avoid damage to the memory module, press the module straight down into the connector while you apply equal force to each end of the module.

5 Insert the module into the connector until the module snaps into position.

If you insert the module correctly, the securing clips snap into the cutouts at each end of the module.



6 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

7 Connect your computer and devices to electrical outlets, and then turn them on.

8 When the message appears stating that memory size has changed, press <F1> to continue.

9 Log on to your computer.

10 Right-click the **My Computer** icon on your Windows desktop and click **Properties**.

11 Click the **General** tab.

12 To verify that the memory is installed correctly, check the amount of memory (RAM) listed.

Removing Memory

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To avoid electrostatic discharge and damage to internal components, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface on the computer chassis.

1 Follow the procedures in "Before You Begin" on page 9.

2 Remove the computer cover (see "Removing the Computer Cover" on page 13).

3 Press out the securing clip at each end of the memory module connector.

4 Grasp the module and pull it upwards.

If the module is difficult to remove, gently ease the module back and forth to remove it from the connector.

5

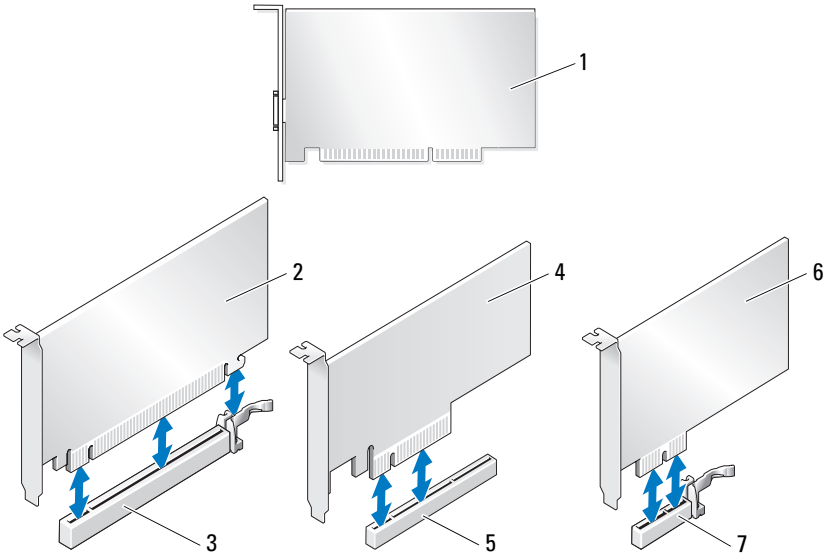
Cards

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

Your Dell™ computer provides the following slots for PCI and PCI Express cards:

- Two PCI Express x16 card slots (can be used in a dual-graphics configuration)
- One PCI Express x8 card slot
- One PCI Express x1 card slot
- Two PCI card slots

NOTE: If a graphics card is installed in each of the PCI Express x16 card slots in the dual-graphics configuration, the PCI Express x1 and one PCI card slot are not accessible for use.



1	PCI card	2	PCI Express x16 card
3	PCI Express x16 card slot	4	PCI Express x8 card
5	PCI Express x8 card slot	6	PCI Express x1 card
7	PCI Express x1 card slot		

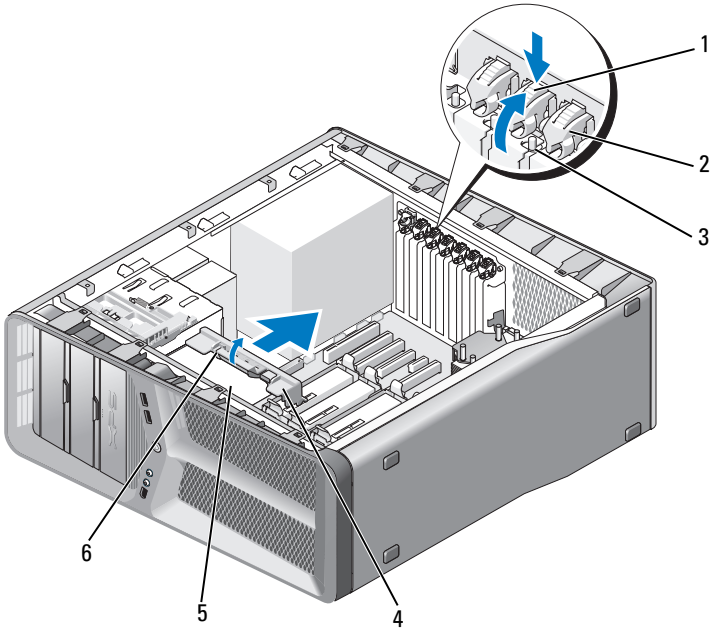
Removing PCI and PCI Express Cards

NOTICE: To avoid electrostatic discharge and damage to internal components, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface on the computer chassis.

NOTICE: If you have the optional dual-graphics card configuration, see "Removing a PCI Express Graphics Card From a Dual Configuration" on page 38 to remove or replace a graphics card.

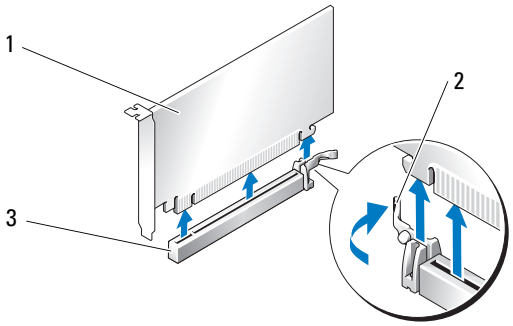
1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Disconnect any cables connected to the card.
4. Press down the release tab on the top of the card retainer at the appropriate card slot and pivot the card retainer back through the chassis wall.
5. Remove the screw that secures the card to the chassis.

NOTE: If the card is full-length, pull back on the alignment guide release tab to release the alignment guide from the fan cage.



1	release tab	2	card retainer
3	screw	4	alignment guide
5	fan cage	6	alignment guide release tab

6 Press the securing tab (if present) on the system board connector as you grasp the card by its top corners, and then ease the card out of the connector.



1	PCI Express x16 card	2	securing tab
3	PCI Express x16 card slot		

7 Install a filler bracket in the empty card-slot opening. If you are replacing the card, see "Installing PCI and PCI Express Cards" on page 35.

NOTICE: Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

NOTICE: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

8 Replace the screw that secures the filler bracket to the chassis.

NOTE: If you removed the alignment guide, replace the alignment guide on the card fan cage; push the alignment guide until it clicks into place.

9 Push the card retainer back into its original position; push its tip so that its tab clicks into place.

10 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug the cable into the computer.

11 Connect your computer and devices to electrical outlets, and then turn them on.

12 Uninstall the driver for the card that you removed.

NOTE: If you removed a sound card or a network adapter, see "Network Adapter and Sound Card Settings" on page 43.

Installing PCI and PCI Express Cards

NOTICE: To avoid electrostatic discharge and damage to internal components, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface on the computer chassis.

NOTICE: If you have or are upgrading to the optional dual-graphics configuration, see "Installing a PCI Express Graphics Card in a Dual Configuration" on page 40 to install a graphics card.

1 Follow the procedures in "Before You Begin" on page 9.

2 Remove the computer cover (see "Replacing the Computer Cover" on page 119).

3 Press down the tab on the top of the card retainer at the appropriate card slot and pivot the card retainer back through the chassis wall.

4 Remove the filler bracket or existing card (see "Removing PCI and PCI Express Cards" on page 32) to create a card-slot opening.

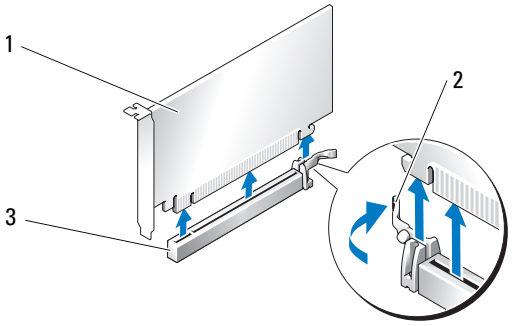
5 Prepare the card for installation.

See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

NOTE: If the card is full-length, pull back on the alignment guide release tab to remove the alignment guide from the card fan cage.

6 Position the card so that it is aligned with the slot and the securing tab (if present).

NOTE: If the card is full-length, insert the card guide into the alignment slot on the card fan cage.

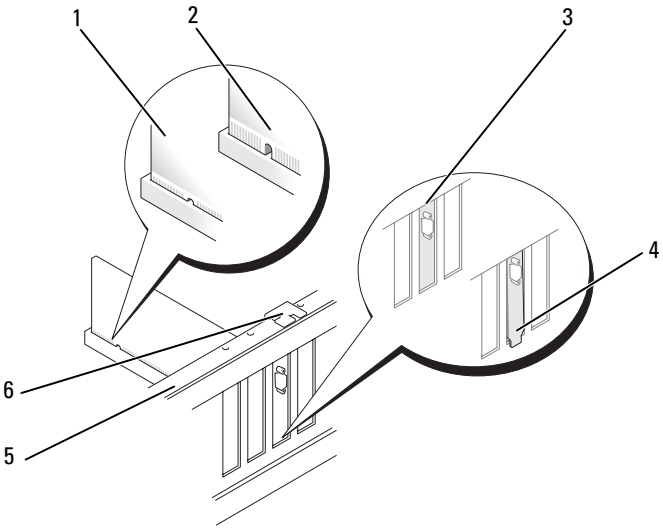


1	PCI Express x16 card	2	securing tab
3	PCI Express x16 card slot		

NOTICE: Ensure that you release the securing tab to seat the card. If the card is not installed correctly, you may damage the system board.

7 Gently pull the securing tab (if present) and place the card in the connector. Press down firmly and ensure that the card is fully seated in the slot.

NOTE: If you removed the alignment guide, replace the alignment guide on the card fan cage; push the alignment guide until it clicks into place.



1	card connector (seated)	2	card connector (not seated)
3	filler bracket properly aligned within the slot	4	filler bracket improperly aligned outside the slot
5	alignment bar	6	alignment guide

NOTICE: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

NOTICE: An incorrectly attached graphics power cable may result in degraded graphics performance.

8 Connect any cables that should be attached to the card.

See the documentation that came with the card for information about the card's cable connections.

9 Replace the screw to secure the card to the chassis.

NOTICE: Before pushing the card retainer back into place, ensure that the tops of all cards and filler brackets are flush with the alignment bar and the notch in the top of each card or filler bracket fits around the alignment guide.

10 Rotate the card retainer back into its original position; push its tip so that its tab clicks into place.

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug the cable into the computer.

11 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

12 Connect your computer and devices to electrical outlets, and then turn them on.

13 Install any drivers required for the card as described in the card documentation.

NOTE: If you installed a sound card or a network adapter, see "Network Adapter and Sound Card Settings" on page 43.

Removing a PCI Express Graphics Card From a Dual Configuration

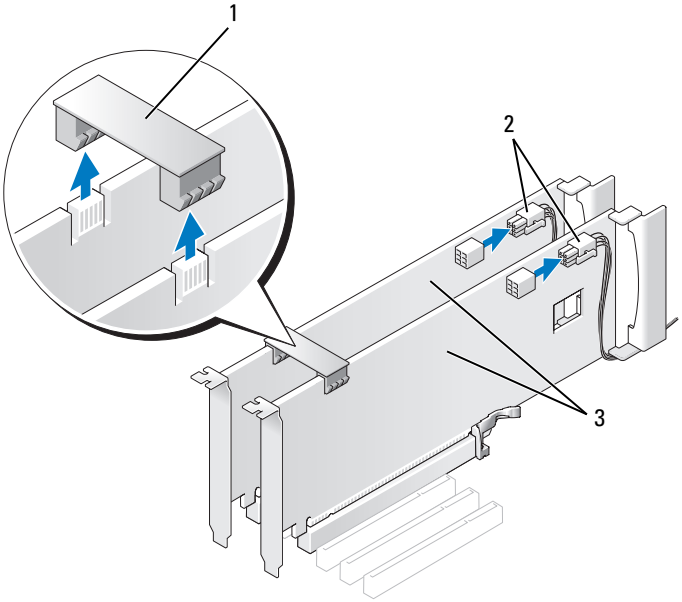
NOTE: Follow the steps described in this section to remove PCI Express x16 graphics cards in dual configuration only. For removal of any other type of PCI or PCI Express cards, see "Removing PCI and PCI Express Cards" on page 32.

1 Follow the procedures in "Before You Begin" on page 9.

2 Remove the computer cover (see "Removing the Computer Cover" on page 13).

3 Gently securing both graphics cards with one hand, remove the graphics card bridge (if present) with your other hand by pulling it up and away from the computer. Set it aside.

NOTE: The graphics card bridge may not be present in all dual-graphics configurations and is not necessary in a single-graphics card configuration.



1	graphics card bridge	2	power connectors (2)
3	dual-PCI Express graphics cards		

4 Disconnect any cables connected to the card.

5 Remove the PCI Express graphics card (see "Removing PCI and PCI Express Cards" on page 32).

NOTICE: Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

6 Install a filler bracket in the empty card-slot opening. If you are replacing the card, see "Installing a PCI Express Graphics Card in a Dual Configuration" on page 40.

NOTICE: Before pushing the card retainer back into place, ensure that the tops of all cards and filler brackets are flush with the alignment bar and the notch in the top of each card or filler bracket fits around the alignment guide.

NOTICE: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

7 Push the card retainer back into its original position; push its tip so that its tab clicks into place.

8 Replace the screw that secures the filler bracket or card to the chassis.

9 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug the cable into the computer.

10 Connect your computer and devices to electrical outlets, and then turn them on.

Installing a PCI Express Graphics Card in a Dual Configuration

NOTE: To upgrade to or downgrade from a dual-graphics configuration, you will need additional parts that can be ordered from Dell (see "Contacting Dell" in your *Owner's Manual*).

This section pertains to dual PCI Express graphics card configurations only. For installation of other types of PCI or PCI Express cards, see "Installing PCI and PCI Express Cards" on page 35.

The PCI Express x1 card slot is not available for use if a graphics card is installed in each of the PCI Express x16 card slots in a dual-graphics card configuration. If you are upgrading from a single graphics card to a dual-graphics card configuration, you will need to remove any card installed in the PCI Express x1 card slot (see "System Board Components" on page 16 to locate the PCI Express x1 card slot). To remove a PCI Express card, see "Removing PCI and PCI Express Cards" on page 32.

NOTICE: For information about upgrading your system to use Nvidia Scalable Link Interface (SLI) dual-graphics technology, see the Dell Support website at **support.dell.com**.

To learn more about dual-graphics technology, see "Understanding Dual Graphics Technology" in your *Owner's Manual*.

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Remove the filler bracket or existing graphics card (see "Removing a PCI Express Graphics Card From a Dual Configuration" on page 38) to create a card-slot opening.

   NOTE: If you are upgrading to a dual-graphics card configuration and have a card installed in the PCI Express x1 card slot, remove the card (see "Removing PCI and PCI Express Cards" on page 32).
4. Install the PCI Express graphics card (see "Installing PCI and PCI Express Cards" on page 35).
5. Prepare the card for installation.

   See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

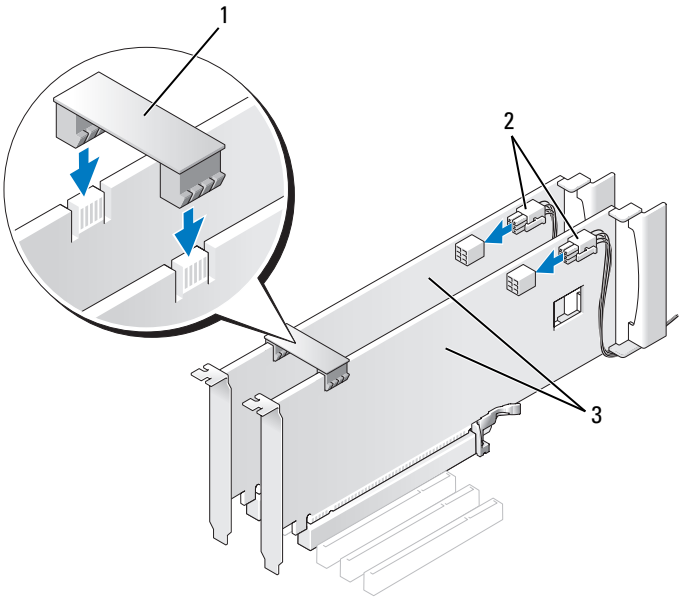
NOTICE: An incorrectly attached graphics power cable may result in degraded graphics performance.

6. Connect any cables that should be attached to the card.

   See the documentation that came with the card for information about the card's cable connections.

NOTICE: Before pushing the card retainer back into place, ensure that the tops of all cards and filler brackets are flush with the alignment bar and the notch in the top of each card or filler bracket fits around the alignment guide.

7. Rotate the card retainer back into its original position; push its tip so that its tab clicks into place.
8. Attach the graphics card bridge (if required for your dual-graphics configuration), pressing firmly so that it completely covers the connector tabs.



1	graphics card bridge (not present on some dual-graphics card configurations)	2	power connectors (2)
3	dual-PCI Express graphics cards		

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug the cable into the computer.

9 If present, lower the card-retention device that lies over the installed cards and snap it into place.

10 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

11 Connect your computer and devices to electrical outlets, and then turn them on.

Network Adapter and Sound Card Settings

If you have installed a sound card:

1. Disconnect the FP_AUDIO cable from the system board (see "System Board Components" on page 16) and connect it to the internal audio connector on your sound card.
2. Connect external audio devices to the sound card connectors. Do not connect external audio devices to the microphone, speaker/headphone, or line-in connectors on the back panel.
3. Enter system setup (see "Entering System Setup" in your *Owner's Manual*), select **Integrated Audio Controller**, and then change the setting to **Off**.

If you have removed a sound card:

1. Enter system setup (see "Entering System Setup" in your *Owner's Manual*), select **Integrated Audio Controller**, and then change the setting to **On**.
2. Connect external audio devices to the audio connectors on the back panel of the computer.

If you have installed an add-in network adapter and want to disable the integrated network adapter:

1. Enter system setup (see "Entering System Setup" in your *Owners's Manual*), select **Integrated NIC Controller,** and then change the setting to **Off**.
2. Connect the network cable to the add-in network adapter connectors. Do not connect the network cable to the integrated connector on the back panel.

If you have removed an add-in network connector:

1. Enter system setup (see "Entering System Setup" in your *Owners's Manual*), select **Integrated NIC Controller**, and then change the setting to **On**.
2. Connect the network cable to the integrated connector on the back panel of the computer.

6

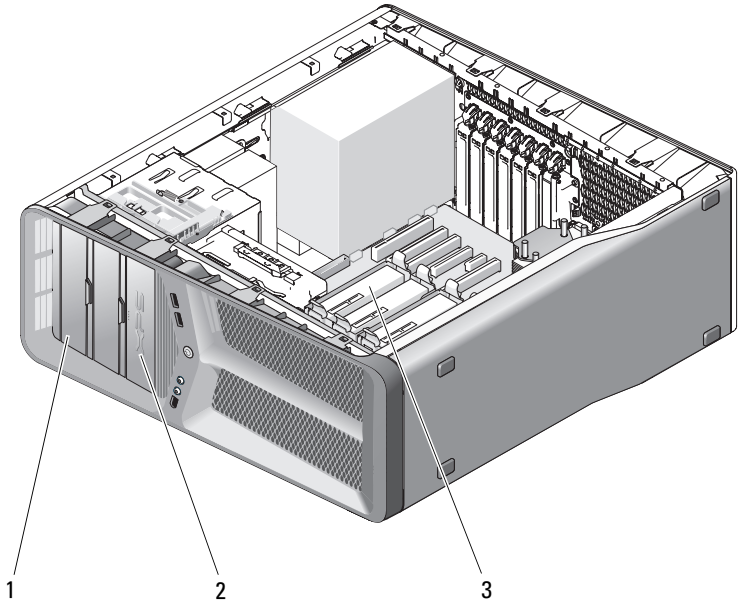
Drives

Your computer supports:

- Four SATA devices (hard drives or optical drives)
- One IDE device (one hard drive or one optical drive)
- One floppy drive or one media card reader

NOTICE: When removing and replacing drives, be sure to leave the drive data and power cables connected to the system board.

NOTE: The 3.5-inch media card reader/floppy drive carrier is not interchangeable with the hard drive carrier.



1	CD/DVD drive bays (2)	2	floppy drive/media card reader
3	hard-drive bays (4)		

About Serial ATA (SATA) Drives

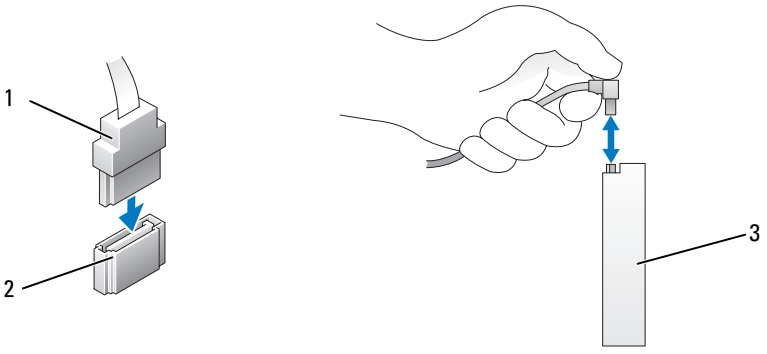
Your computer supports up to four serial ATA hard drives and two serial ATA optical drives. SATA drives provide the following benefits by transferring data using serial technology and flexible cables that are thinner and longer than IDE cables:

- Improved cable routing facilitates more efficient airflow inside the chassis.
- Compact cable connectors save space on the system board and on the hard drive, allowing for more efficient utilization of space inside the chassis.

General Drive Installation Guidelines

SATA drives should be connected to connectors labeled "SATA" on the system board. IDE drives should be connected to the connectors labeled "IDE."

When connecting a SATA cable, hold the cable by the connector at each end and press firmly into the connector. When disconnecting a SATA cable, hold the cable by the connector at each end and pull until the connector detaches.



1	SATA data cable	2	SATA data connector (on the system board)
3	SATA drive		

When you connect two IDE devices to a single IDE data cable and configure the devices for the cable select setting, the device attached to the last connector on the data cable is the primary device or the boot device, and the

device attached to the middle connector on the data cable is the secondary device. See the drive documentation in your upgrade kit for information on configuring devices for the cable select setting.

To connect an IDE data cable, align the tab on one connector with the notch on the other. When disconnecting an IDE data cable, grasp the colored pull-tab and pull until the connector detaches.

Hard Drive

Removing a Hard Drive

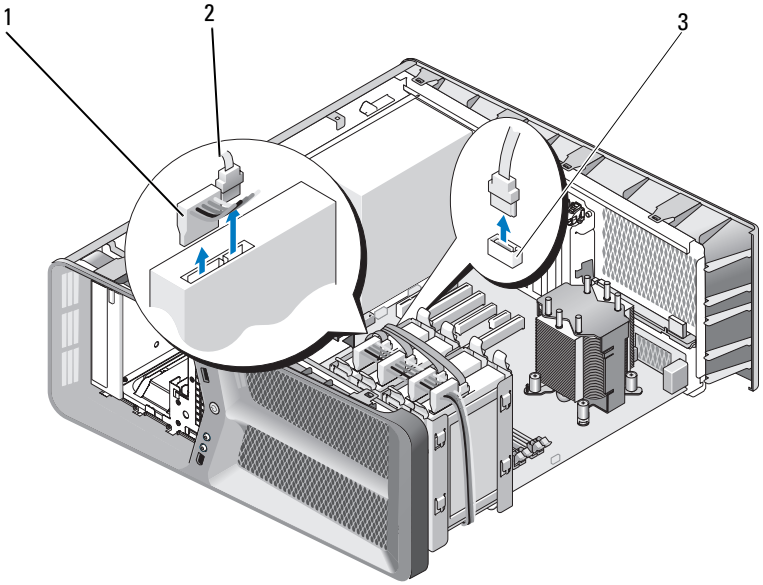
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

NOTICE: If you are replacing a hard drive that contains data that you want to keep, back up your files before you begin this procedure.

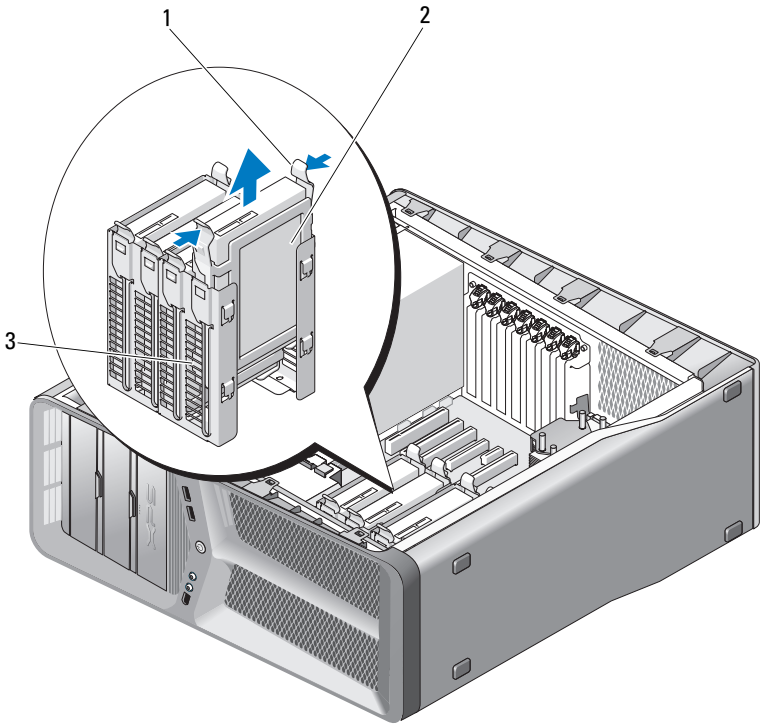
1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Disconnect the power cable and the data cable from the hard drive.

   NOTE: If you are not replacing the hard drive at this time, disconnect the other end of the data cable from the system board and set it aside. You can use the data cable to install a hard drive at a later time.



1	SATA power cable	2	SATA data cable
3	SATA data connector (on the system board)		

4 Press the black tabs on each side of the hard-drive bracket towards each other and slide the drive up and out of the hard-drive bay.



1	black tabs (2)	2	hard drive
3	hard-drive bay		

5 Ensure that all the connectors are properly cabled and firmly seated.

6 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

7 Connect your computer and devices to electrical outlets, and then turn them on.

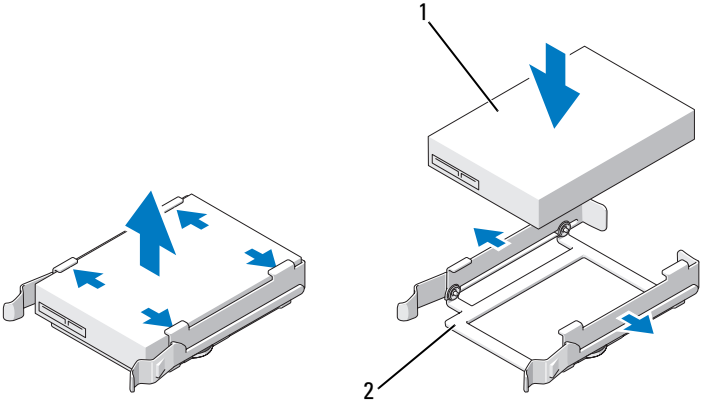
Installing a Hard Drive

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Remove the existing hard drive, if applicable (see "Removing a Hard Drive" on page 47).

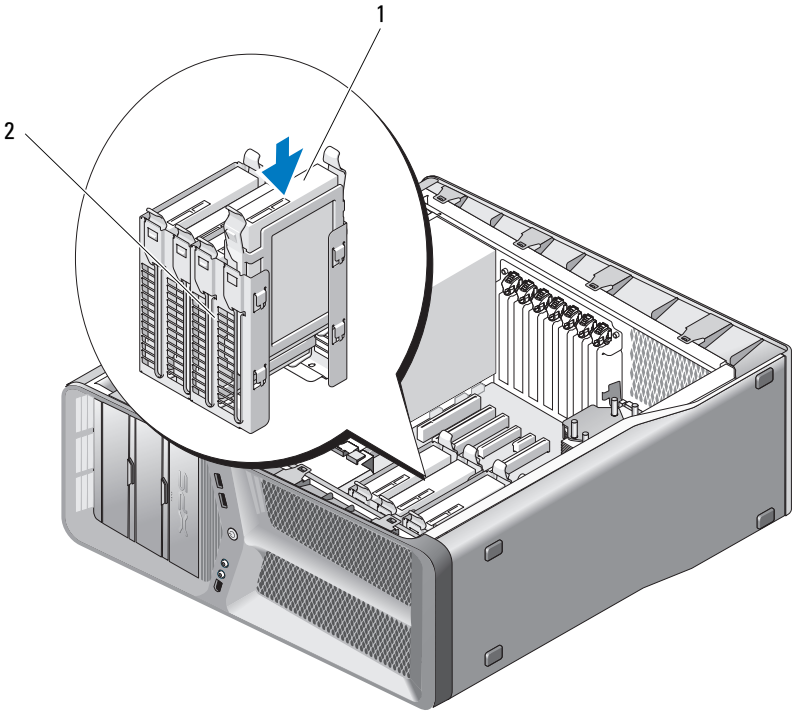
   NOTE: If a hard-drive bracket is installed inside the hard-drive bay, remove the bracket before you install the new hard drive.
4. Prepare the new hard drive for installation and check the documentation for the hard drive to verify that the hard drive is configured for your computer.

   NOTE: If the hard drive you are installing does not have a hard-drive bracket attached, use your original hard-drive bracket; snap the bracket onto the new drive.



1 hard drive 2 hard-drive bracket

5. Verify that the hard-drive bay is empty and unobstructed.
6. Slide the hard drive into the hard-drive bay until it clicks securely into place.

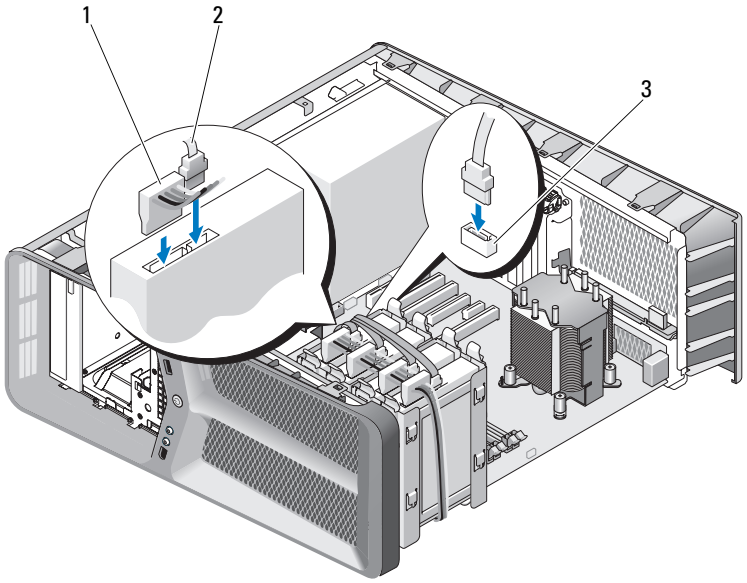


1 hard drive 2 hard-drive bay

NOTICE: Ensure that all the connectors are properly cabled and firmly seated.

7 Connect the power and data cables to the hard drive.

NOTE: If you disconnected the data cable while removing the hard drive or if you are installing a new hard drive, connect the data cable to the system board.



1	SATA power cable	2	SATA data cable
3	SATA data connector (on the system board)		

8 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

9 Connect your computer and devices to electrical outlets, and then turn them on.

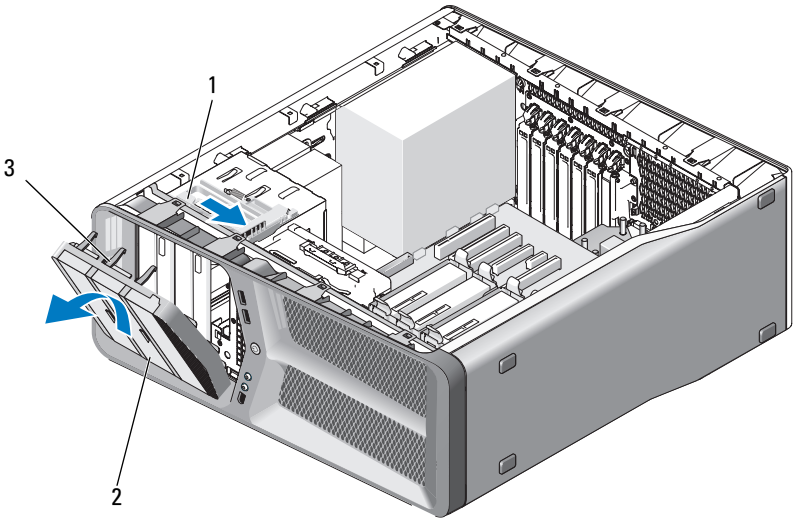
See the documentation that came with the drive for instructions on installing any software required for drive operation.

Drive Panel

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

Removing the Drive Panel

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Grasp the drive-release latch and slide it towards the base of the computer until the drive panel snaps open.

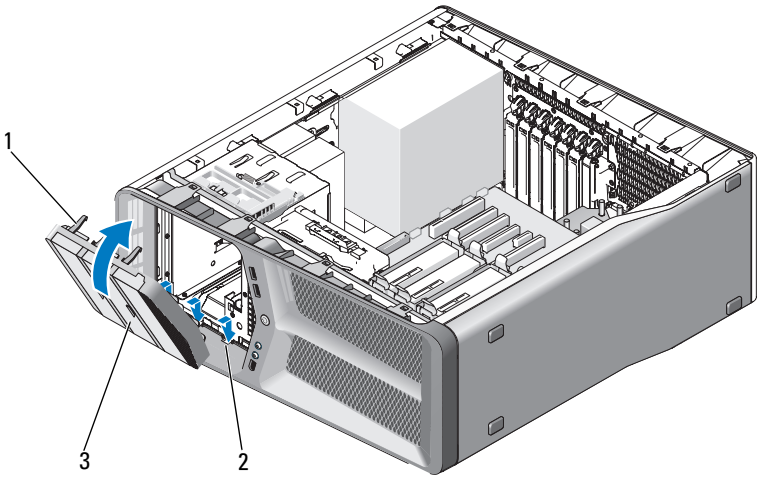


1	drive-release latch	2	drive panel
3	drive-panel tabs (3)		

4. Pivot the drive panel outward and lift it from its side hinges.
5. Set the drive panel aside in a secure location.

Installing the Drive Panel

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Align the drive-panel tabs with the side-door hinges.



1	drive-panel tabs (3)	2	side-door hinges (3)
3	drive panel		

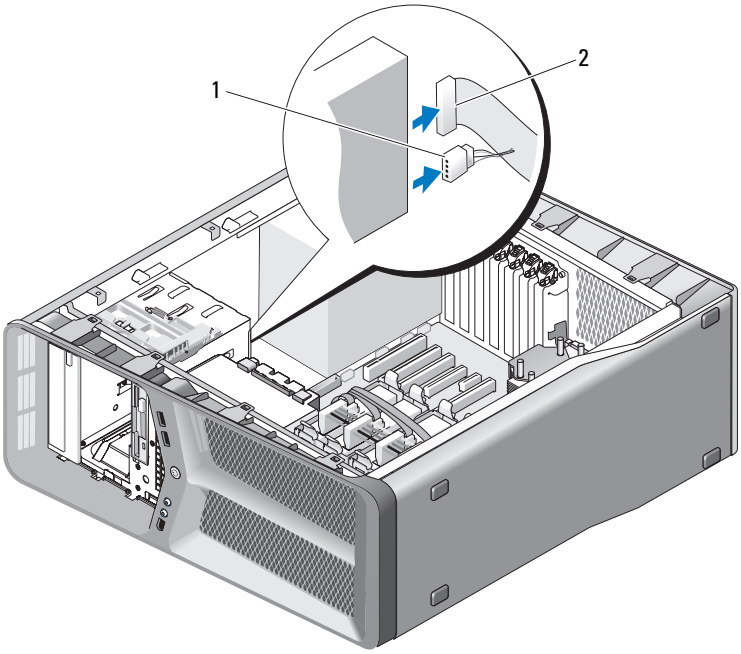
4. Rotate the drive panel toward the computer until it snaps into place.
5. Replace the computer cover (see "Replacing the Computer Cover" on page 119).

Floppy Drive

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

Removing a Floppy Drive

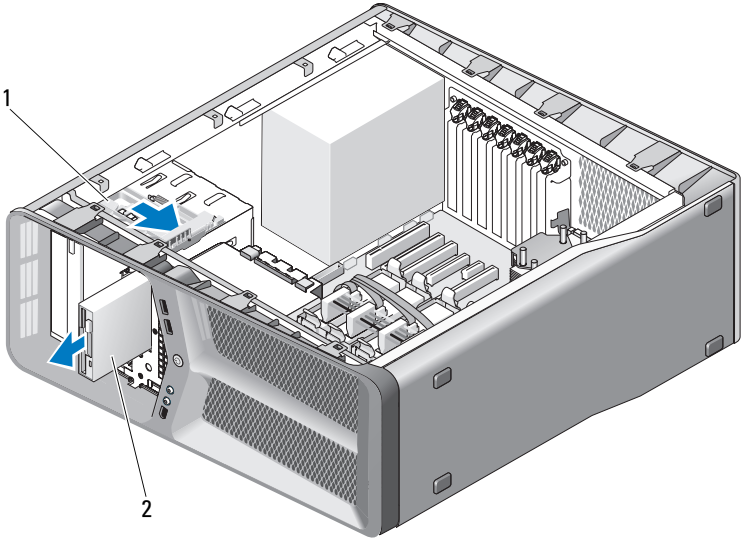
1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Remove the drive panel (see "Removing the Drive Panel" on page 53).
4. Disconnect the power and data cables from the back of the floppy drive.



1 power cable

2 floppy-drive data cable

5 Slide the drive-release latch towards the base of the computer to release the shoulder screw, and then slide the drive out of the drive bay.



1 drive-release latch 2 floppy drive

6 Replace the drive panel (see "Installing the Drive Panel" on page 54).

7 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

8 Connect your computer and devices to electrical outlets, and then turn them on.

Installing a Floppy Drive

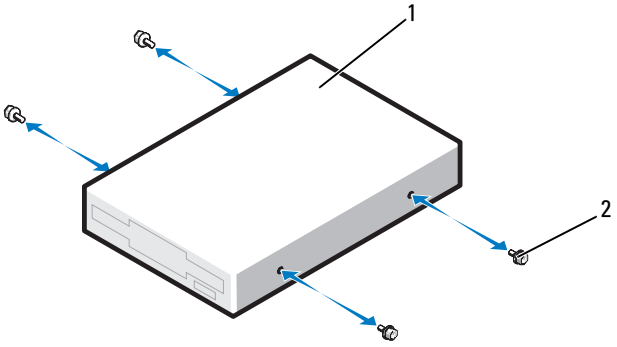
1 Follow the procedures in "Before You Begin" on page 9.

2 Remove the computer cover (see "Removing the Computer Cover" on page 13).

3 Remove the drive panel (see "Removing the Drive Panel" on page 53).

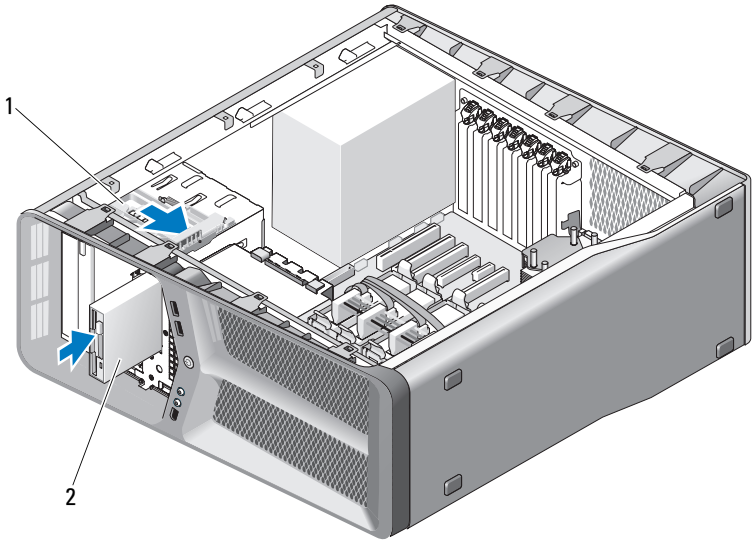
4 Remove the existing floppy drive, if applicable (see "Removing a Floppy Drive" on page 55).

5 If no screws are attached to the new floppy drive, check the inside of the drive panel for shoulder screws. If screws are present, attach the screws to the new drive.



1 floppy drive 2 shoulder screws (4)

6 Slide the floppy drive into the drive bay until it clicks into place.



1	drive-release latch	2	floppy drive

7 Connect the power and data cables to the back of the floppy drive.

8 Check all cable connections and fold cables out of the way to avoid blocking airflow between the fan and cooling vents.

9 Replace the drive panel (see "Installing the Drive Panel" on page 54).

10 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it in to the computer.

11 Connect your computer and devices to electrical outlets, and then turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

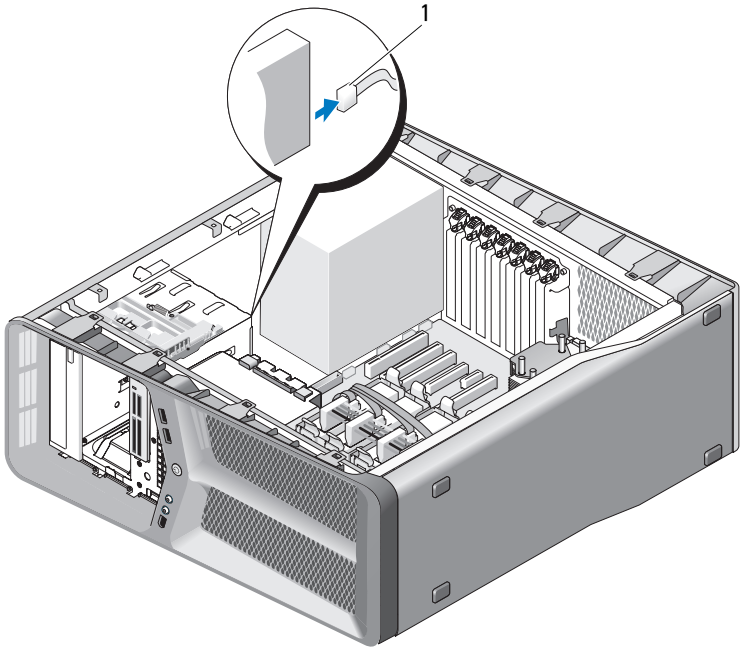
12 Enter system setup (see "Entering System Setup" in your *Owner's Manual*), and select the appropriate **Diskette Drive** option.

Media Card Reader

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

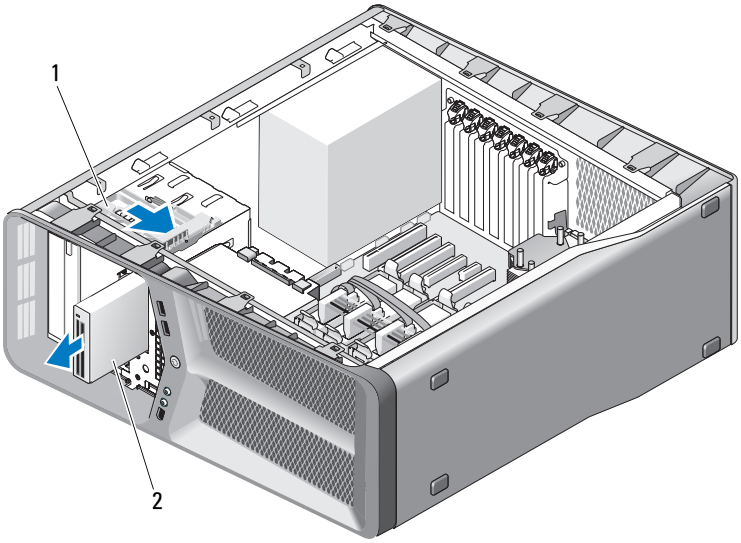
Removing a Media Card Reader

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Remove the drive panel (see "Removing the Drive Panel" on page 53).
4. Disconnect the media card reader cable from the back of the media card reader.



1 media card reader cable

5 Slide the drive-release latch towards the base of the computer to release the shoulder screw, and then slide the media card reader out of the drive bay.



1 drive-release latch 2 media card reader

6 Replace the drive panel (see "Installing the Drive Panel" on page 54).

7 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

8 Connect your computer and devices to electrical outlets, and then turn them on.

Installing a Media Card Reader

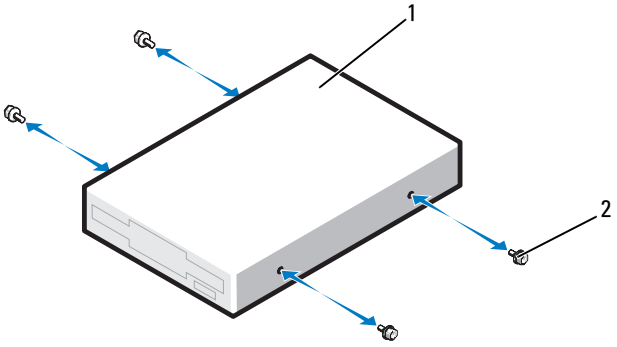
1 Follow the procedures in "Before You Begin" on page 9.

2 Remove the computer cover (see "Removing the Computer Cover" on page 13).

3 Remove the drive panel (see "Removing the Drive Panel" on page 53).

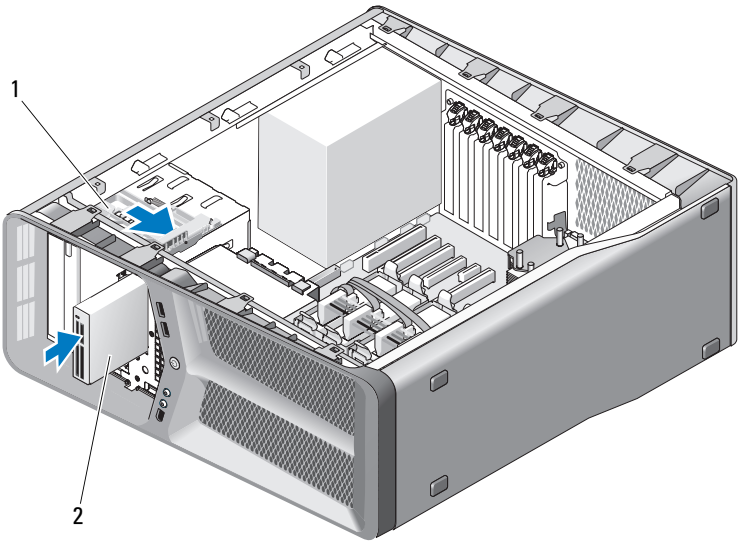
4 Remove the existing media card reader, if applicable (see "Removing a Media Card Reader" on page 59).

5 If no screws are attached to the media card reader, check the inside of the drive panel for shoulder screws. If screws are present, attach the screws to the new card reader.



1 media card reader 2 shoulder screws (4)

6 Slide the media card reader into the drive bay until it clicks into place.



1	drive-release latch	2	media card reader

7 Attach the media card reader cable to the back of the media card reader.

8 Check all cable connections and fold cables out of the way to avoid blocking airflow between the fan and cooling vents.

9 Replace the drive panel (see "Installing the Drive Panel" on page 54).

10 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it in to the computer.

11 Connect your computer and devices to electrical outlets, and then turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

12 Enter system setup (see "Entering System Setup" in the *Owner's Manual*) and select the appropriate **USB for FlexBay** option.

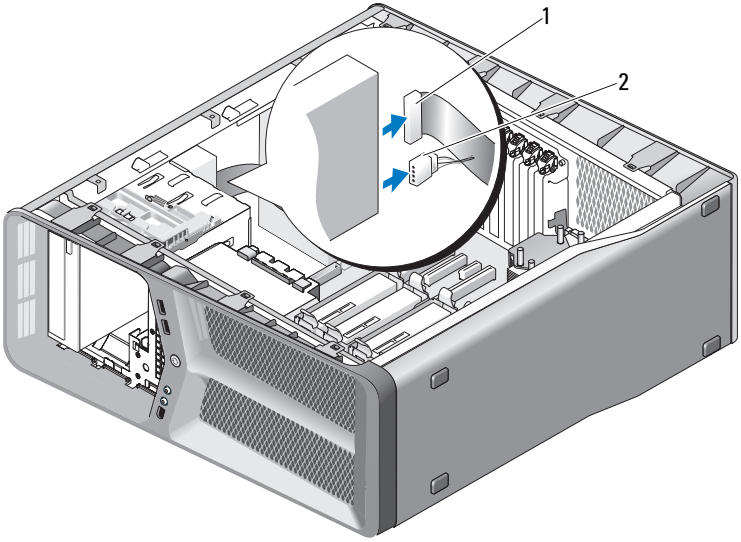
CD/DVD Drive

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

Removing a CD/DVD Drive

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Remove the drive panel (see "Removing the Drive Panel" on page 53).
4. Disconnect the power and data cables from the back of the drive.

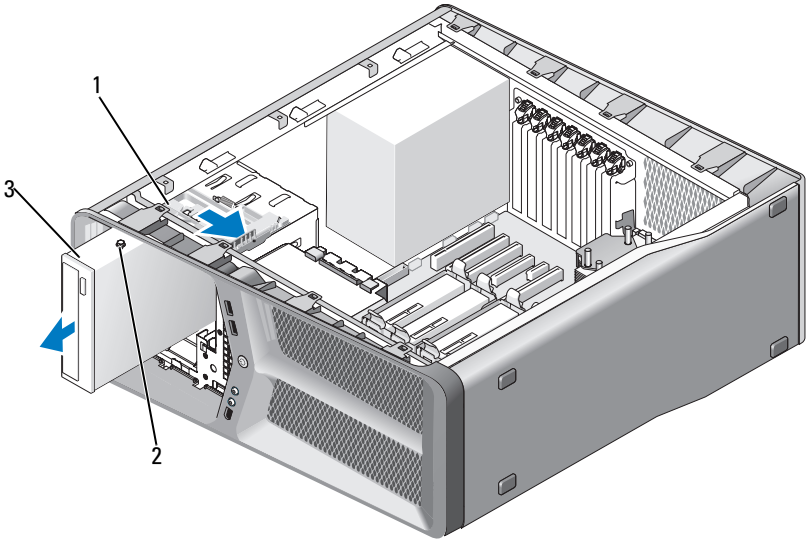
NOTE: If you are uninstalling the only CD/DVD drive in your computer and will not replace it at this time, disconnect the data cable from the system board and set it aside.



1 data cable

2 power cable

5 Slide the drive-release latch towards the base of the computer to release the shoulder screw, and then slide the CD/DVD drive out of the drive bay.



1	drive-release latch	2	shoulder screws (3)
3	CD/DVD drive		

6 Replace the drive panel (see "Installing the Drive Panel" on page 54).

7 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

8 Connect your computer and devices to electrical outlets, and then turn them on.

Installing a CD/DVD Drive

1 Follow the procedures in "Before You Begin" on page 9.

2 Remove the computer cover (see "Removing the Computer Cover" on page 13).

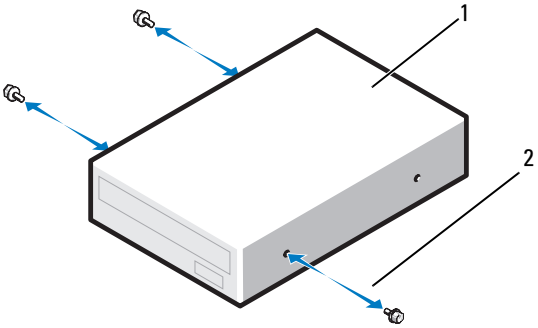
3 Remove the drive panel (see "Removing the Drive Panel" on page 53).

4 Remove the existing CD/DVD drive, if applicable (see "Removing a CD/DVD Drive" on page 63).

5 Prepare the CD/DVD drive for installation and check the documentation that accompanied the drive to verify that the drive is configured for your computer.

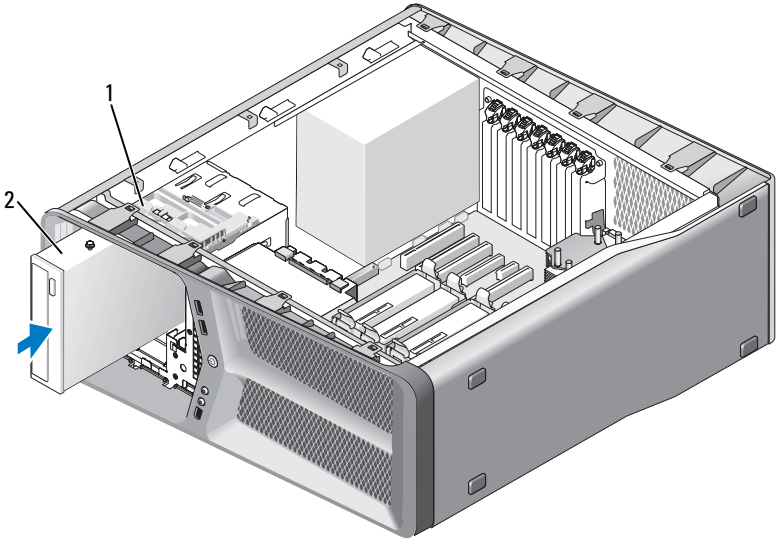
NOTE: If you are installing an IDE drive, configure the drive for the cable select setting.

6 If no screws are attached to the drive, check the inside of the drive panel for screws and, if screws are present, attach the screws to the new drive.



1 CD/DVD drive 2 shoulder screws (3)

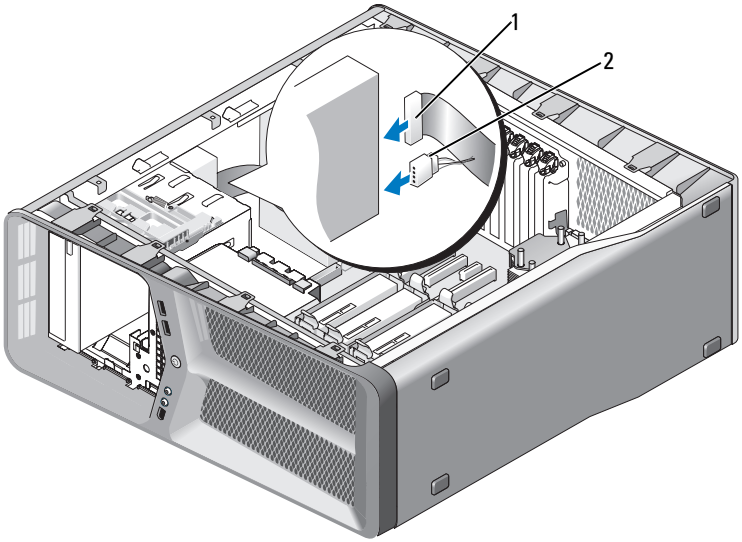
7 Gently slide the drive into the drive bay until it clicks into place.



1 drive-release latch 2 CD/DVD drive

8 Attach the power and data cables to the CD/DVD drive.

To locate the system board connector, see "System Board Components" on page 16.



1	power cable	2	data cable

9 Check all cable connections and fold cables out of the way to avoid blocking airflow between the fan and cooling vents.

10 Replace the drive panel (see "Installing the Drive Panel" on page 54).

11 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it in to the computer.

12 Connect your computer and devices to electrical outlets, and then turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

13 Enter system setup (see "Entering System Setup" in the *Owner's Manual*) and select the appropriate **Drive** option.

7

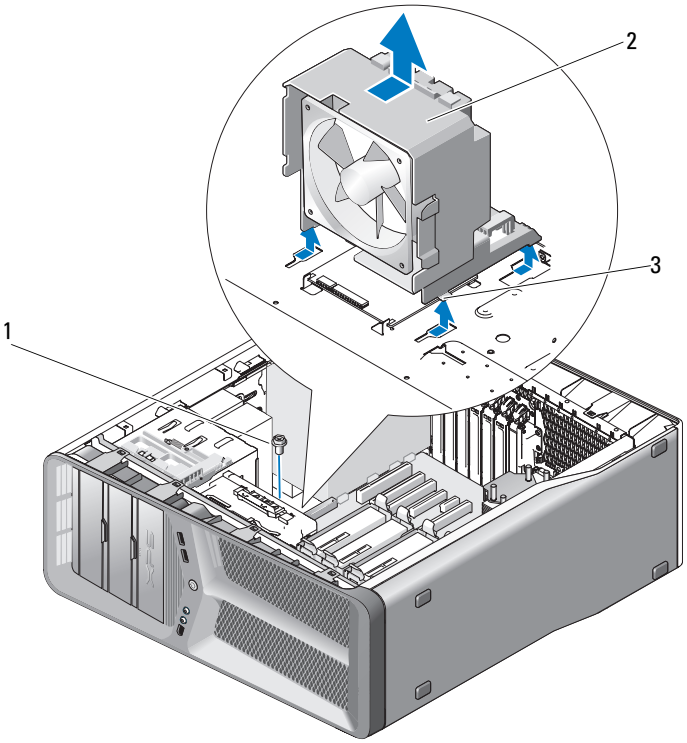
Fans

Removing the Card Fan

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Gather all the cables from the cable holder on the alignment guide and remove any full-length expansion cards (see "Removing PCI and PCI Express Cards" on page 32).

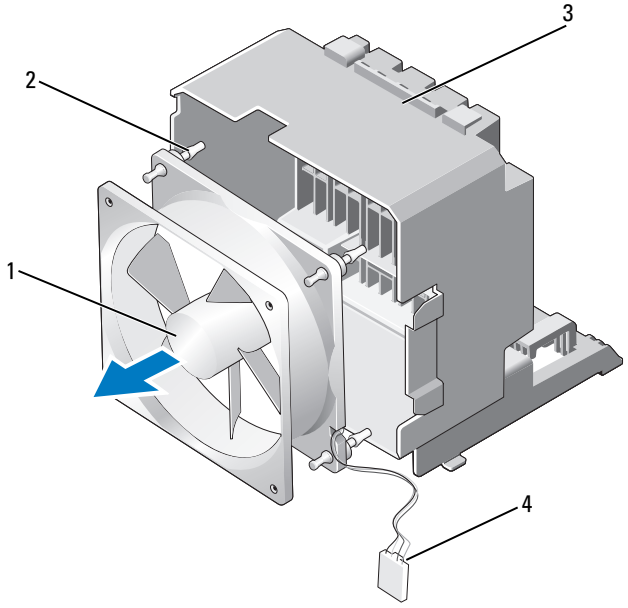
NOTICE: Note the location of each connector before disconnecting the cables.

4. Disconnect all the cables from the master I/O Board (see "Master I/O Board Components" on page 101).
5. Remove the screw that secures the card fan cage to the chassis and then slide the card fan cage back and out of the chassis.



1	screw	2	card fan cage
3	tabs (4)		

6 In succession, carefully pull on each corner of the card fan to detach the rubber grommets securing the card fan to the card fan cage.



1	card fan	2	rubber grommet (4)
3	card fan cage	4	card fan power cable

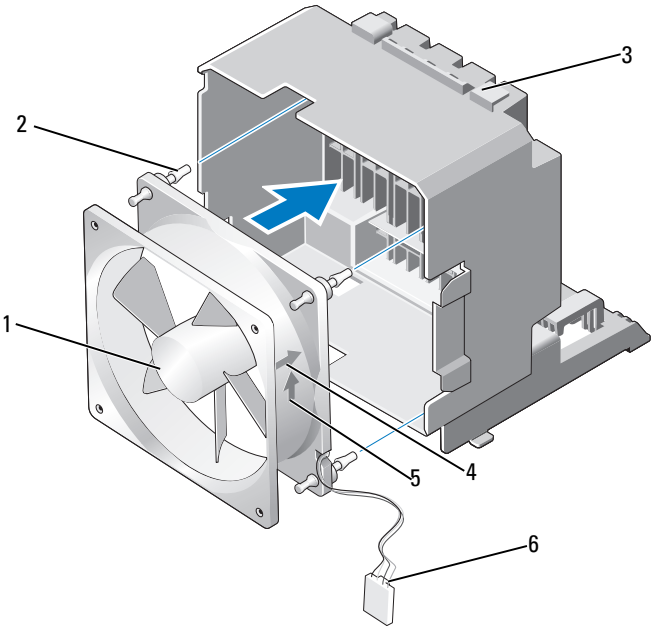
7 Set the card fan aside in a secure location.

Installing the Card Fan

NOTICE: Ensure that the fan power cable is correctly routed through the opening in the lower-right corner of the fan cage.

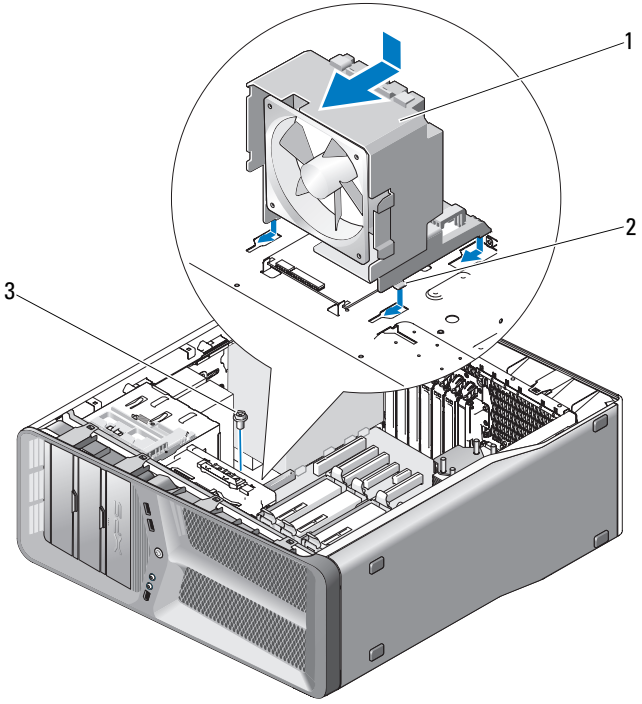
1 With the card fan power cable oriented downward, align the rubber grommets in the fan with the openings in each corner of the card fan cage, then pull the grommets through until they snap into place.

NOTE: Airflow direction and orientation are shown on the side of the fan.



1	card fan	2	rubber grommet (4)
3	card fan cage	4	card-fan orientation direction arrow
5	air-flow direction arrow	6	card fan power cable

2 Insert the four tabs along the bottom of the card fan cage into the corresponding slots on the chassis, then slide the card fan cage forward until it snaps into place.



1	card fan cage	2	tabs (4)
3	screw		

3 Replace the screw that secures the card fan cage to the chassis.

4 Connect the cables to the master I/O board (see "Power Supply Unit (PSU) DC Connector Pin Assignments" on page 18).

5 Replace any full-length expansion cards that you removed (see "Installing PCI and PCI Express Cards" on page 35).

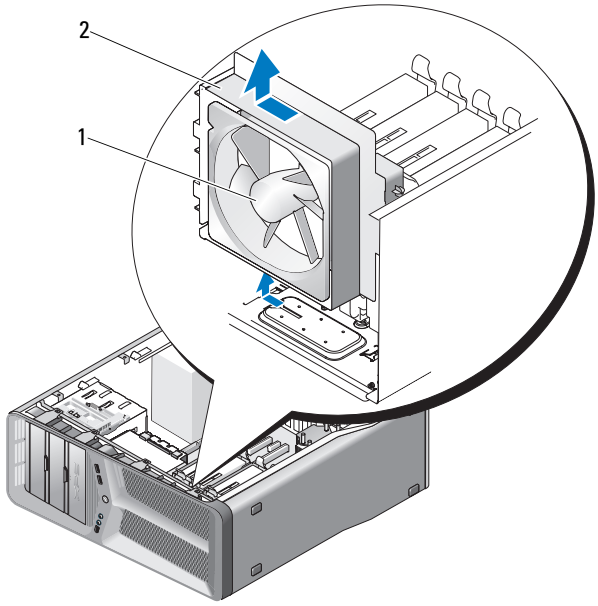
6 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into your computer.

7 Connect your computer and devices to electrical outlets, and then turn them on.

Removing the Hard Drive Fan

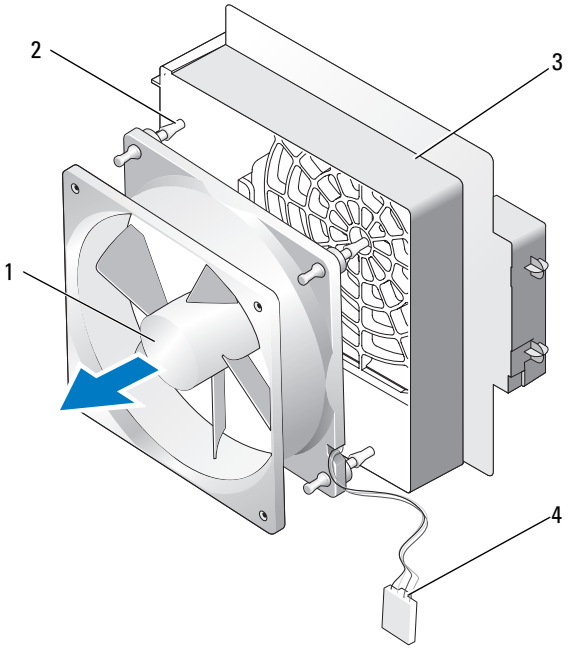
1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Remove the card fan cage (see "Removing the Card Fan" on page 69).
4. Disconnect the hard drive fan cable from the FAN_HDD connector on the master I/O board (see "Power Supply Unit (PSU) DC Connector Pin Assignments" on page 18).
5. Slide the hard drive fan cage out from behind the hard drive bays, then lift it from the computer.



1 hard-drive fan

2 hard-drive fan cage

6 In succession, carefully pull on each corner of the hard drive fan to detach the rubber grommets securing the hard drive fan to the hard drive fan cage.



1	hard-drive fan	2	rubber grommets
3	hard-drive fan cage	4	hard-drive fan cable

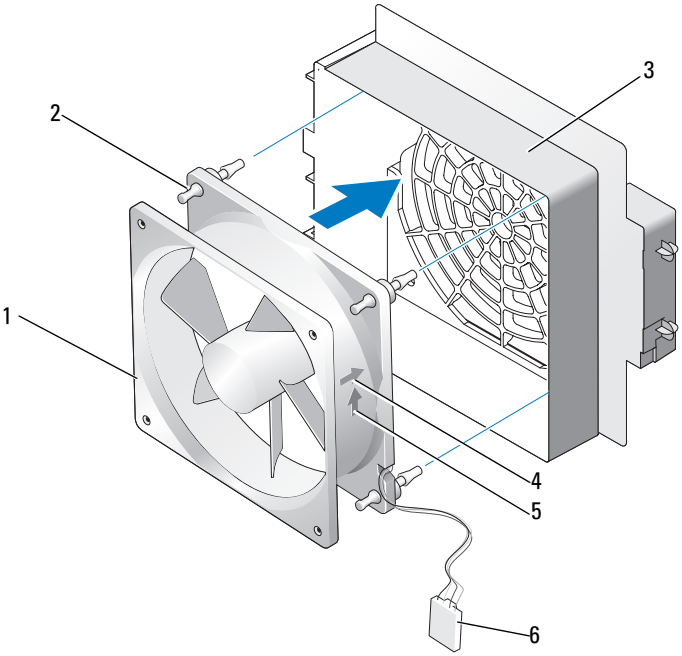
7 Set the hard drive fan aside in a secure location.

Installing the Hard Drive Fan

NOTICE: Ensure that the hard drive fan cable is correctly routed through the opening in the lower-right corner of the fan cage.

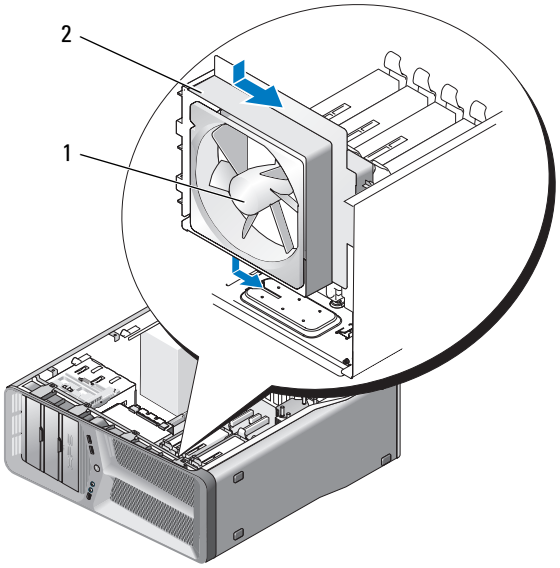
1 With the hard drive fan cable oriented downward, align the rubber grommets in the fan with the openings in each corner of the fan cage, then pull the grommets through until they snap into place.

NOTE: Airflow direction and orientation are shown on the side of the fan.



1	hard drive fan	2	rubber grommets
3	hard drive fan cage	4	hard drive fan orientation direction arrow
5	air-flow direction arrow	6	hard drive fan cable

2 Insert the tab along the bottom of the hard drive fan cage into the corresponding slot on the chassis, then slide the hard drive fan cage behind the hard drive bays until it snaps into place.



1	hard drive fan	2	hard drive fan cage

3 Connect the hard drive fan cable to the FAN_HDD connector on the master I/O board (see "Power Supply Unit (PSU) DC Connector Pin Assignments" on page 18).

4 Replace the card fan cage (see "Installing the Card Fan" on page 71).

5 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into your computer.

6 Connect your computer and devices to electrical outlets, and then turn them on.

8

Processor Heatsink

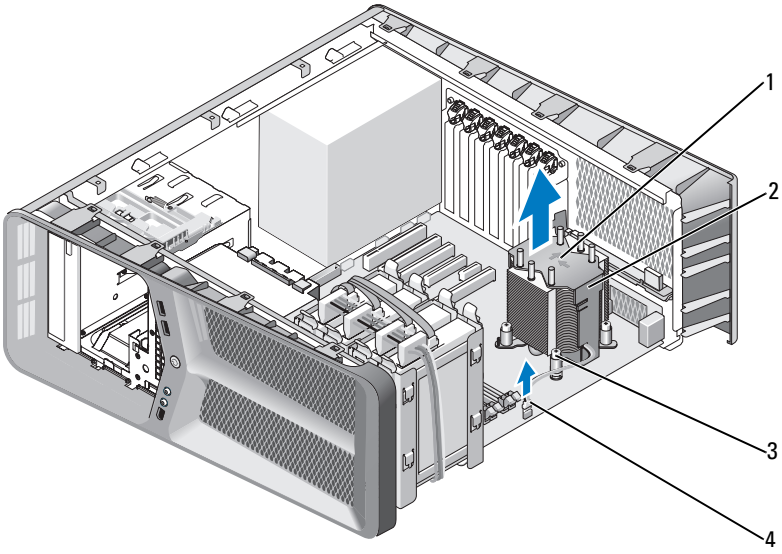
CAUTION: Before you perform this procedure, follow the safety instructions located in the *Product Information Guide*.

Removing the Processor Heatsink

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).

CAUTION: The processor heat sink can get very hot during normal operation. Be sure that the heat sink has had sufficient time to cool before you touch it.

3. Disconnect the fan cable from the FAN_CPU connector on the system board (see "System Board Components" on page 16).
4. Loosen the four captive screws securing the processor heatsink to the system board.



1	airflow direction and orientation arrows	2	processor heatsink
3	captive screws (4)	4	FAN_CPU cable

NOTICE: When you remove the processor heatsink, lay it upside down or on its side to avoid damaging the heatsink thermal interface.

5 Lift the processor heatsink out of the computer, and set it aside.

Installing the Processor Heatsink

1 Follow the procedures in "Before You Begin" on page 9.

2 Remove the computer cover (see "Removing the Computer Cover" on page 13).

NOTICE: Incorrect alignment of the processor heatsink can cause damage to the system board and processor.

3 Align the four captive screws on the processor heatsink with the holes on the system board.

NOTE: Airflow direction and orientation are shown on top of the heatsink.

4 Tighten the four captive screws.

5 Connect the fan cable to the FAN_CPU connector on the system board (see "System Board Components" on page 16).

6 Close the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

7 Connect your computer and devices to electrical outlets, and then turn them on.

9

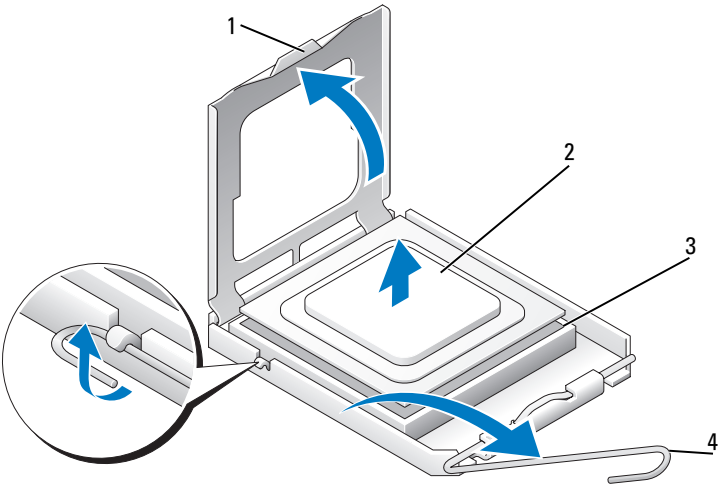
Processor

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: Do not perform the following steps unless you are familiar with hardware removal and replacement. Performing these steps incorrectly could damage your system board. For technical service, see "Contacting Dell" in your *Owner's Manual*.

Removing the Processor

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Disconnect the power cables from the POWER and 12V_ATXP connectors (see "System Board Components" on page 16) on the system board.
4. Remove the processor heatsink (see "Removing the Processor Heatsink" on page 79).
5. Push down and out on the socket release lever.
6. Lift the socket release lever and open the processor cover.



1	processor cover	2	processor
3	socket	4	socket release lever

7 Remove the processor from the socket.

Leave the release lever extended in the release position so that the socket is ready for the processor to be replaced.

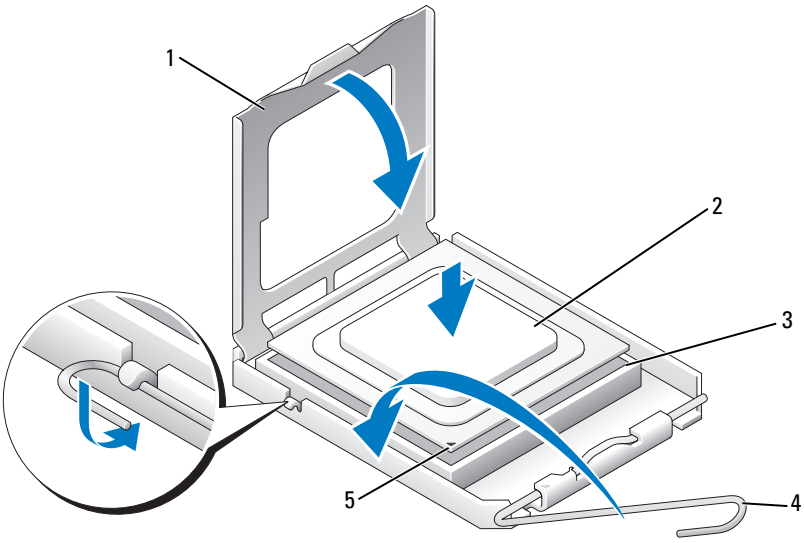
Installing the Processor

NOTICE: Ground yourself by touching an unpainted metal surface on the back of the computer.

NOTICE: You must position the processor correctly in the socket to avoid permanent damage to the processor and the computer when you turn on the computer.

NOTE: If the socket release lever is not fully extended, extend it before you install the processor.

1 Align the pin-1 corner of the processor and socket.



1	processor cover	2	processor
3	socket	4	socket release lever
5	socket pin-1 indicator		

NOTICE: Socket pins are delicate. To avoid damage, ensure that the processor is aligned properly with the socket, and do not use excessive force when you install the processor. Be careful not to touch or bend the pins on the system board.

2. Set the processor lightly in the socket and ensure that the processor is aligned in the socket. When the processor is positioned correctly, apply minimal pressure to seat it.
3. When the processor is fully seated in the socket, close the processor cover.
4. Pivot the socket release lever back toward the socket and snap it into place to secure the processor.
5. Replace the processor heatsink (see "Installing the Processor Heatsink" on page 80).
6. Reconnect the power cables to the POWER and 12V_ATXP connectors (see "System Board Components" on page 16) on the system board.

7 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

8 Connect your computer and devices to electrical outlets, and then turn them on.

10

System Board

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*

Removing the System Board

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).

CAUTION: The processor heat sink can get very hot during normal operation. Be sure that the heat sink has had sufficient time to cool before you touch it.

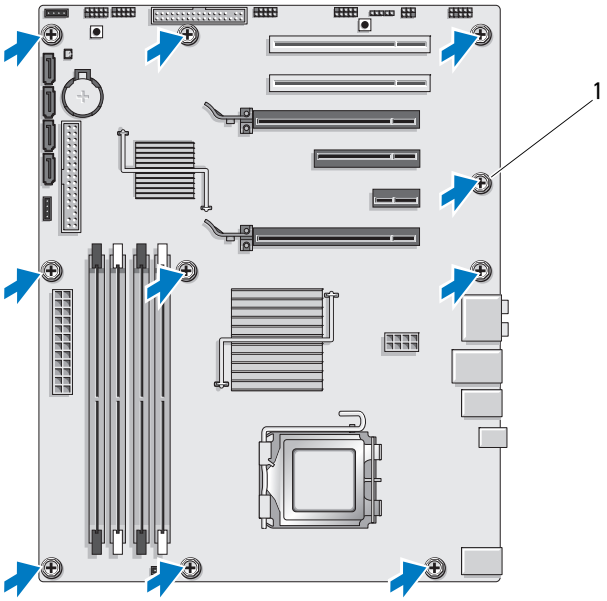
3. Remove the processor heatsink (see "Removing the Processor Heatsink" on page 79).
4. Remove all the expansion cards (see "Removing PCI and PCI Express Cards" on page 32).
5. Remove any additional components that may restrict access to the system board.

NOTICE: Carefully note the routing and location of each cable before you disconnect it, so that you are sure to re-route cables correctly. An incorrectly routed or a disconnected cable could lead to computer problems.

6. Disconnect all cables from the system board.

NOTICE: If you are replacing the system board, visually compare the replacement system board to the existing system board to make sure that you have the correct part.

7. Remove the 10 screws that secure the system board to the chassis.



1 screw (10)

8 Carefully, lift the system board out of the computer.

Installing the System Board

NOTICE: If you are replacing the system board, visually compare the replacement system board to the existing system board to make sure that you have the correct part.

NOTE: Some components and connectors on replacement system boards may be in different locations than corresponding connectors on the existing system board.

NOTE: Jumper settings on replacement system boards are preset at the factory.

1 Transfer components from the existing system board to the replacement system board, if applicable.

2 Orient the system board by aligning the screw holes on the system board with the screw holes on the chassis.

3 Replace the 10 screws to secure the system board to the chassis.

4 Replace the processor heatsink (see "Installing the Processor Heatsink" on page 80).

5 Replace any expansion cards that you removed (see "Installing PCI and PCI Express Cards" on page 35).

6 Replace any additional components that you removed from the system board.

7 Reconnect all cables to the system board.

8 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into your computer.

9 Connect your computer and devices to electrical outlets, and then turn them on.

10 Flash the system BIOS, as needed.

NOTE: For information on flashing the system BIOS, see the Dell Support website at support.dell.com.

11

Power Supply

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

Removing the Power Supply

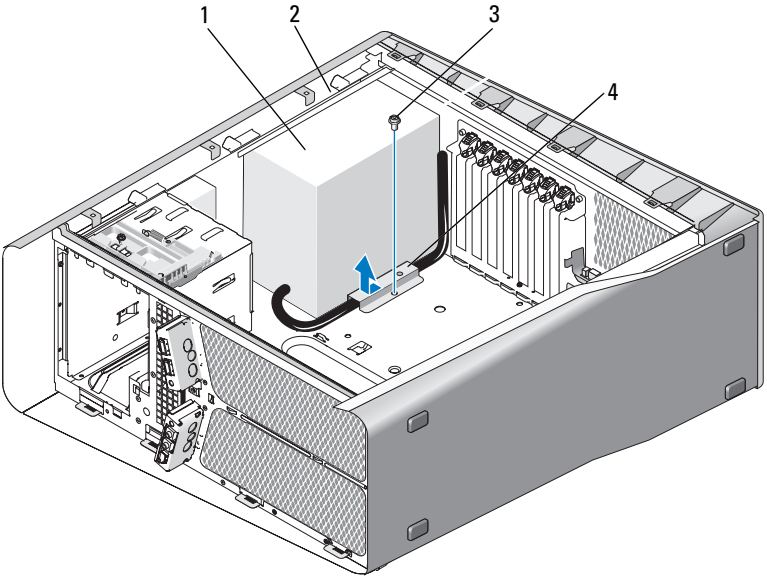
1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).

NOTICE: Note the location and ID of each power connector before disconnecting the power supply cables.

3. Follow the DC power cables that stem from the power supply and disconnect each connected power cable.

   NOTE: Note the routing of the power cable bundles as you disconnect them. You must route these cables properly when you replace them to prevent them from being pinched or crimped.

4. Remove the system board (see "Removing the System Board" on page 87).
5. Remove the four screws that secure the power supply to the back of the chassis.
6. Remove the screw that secures the power supply cable clamp to the chassis.
7. Slide the cable clamp towards the front of the computer to free it from the securing tabs on the computer chassis, then lift the cable clamp up and away from the computer.



1	power supply	2	protruding lip of the chassis
3	screw	4	cable clamp

8. Gather the power supply cable bundles that stem from the power supply, for easy removal.
9. Slide the power supply towards the front of the computer, to free it from the securing tabs on the computer chassis.
10. Slide the power supply towards the expansion cards, to clear the protruding lip of the chassis.
11. Lift the power supply up and out of the computer.

Installing the Power Supply

1. Slide the power supply into place, ensuring that the tabs on the rear wall of the computer chassis latch into place.
2. Replace the four screws that secure the power supply to the back of the computer chassis.

3 Reroute the DC power cables as you found them.

4 Insert the tab along the bottom of the cable clamp into the corresponding slot on the chassis, then slide the cable clamp towards the rear of the computer chassis until it snaps into place.

5 Replace the screw that secures the cable clamp to the chassis.

6 Replace the system board (see "Installing the System Board" on page 88).

7 Reattach each of the DC power cables that were previously connected, carefully rerouting them as you found them.

8 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

9 Connect your computer and devices to electrical outlets, and then turn them on.

12

Front I/O Panel

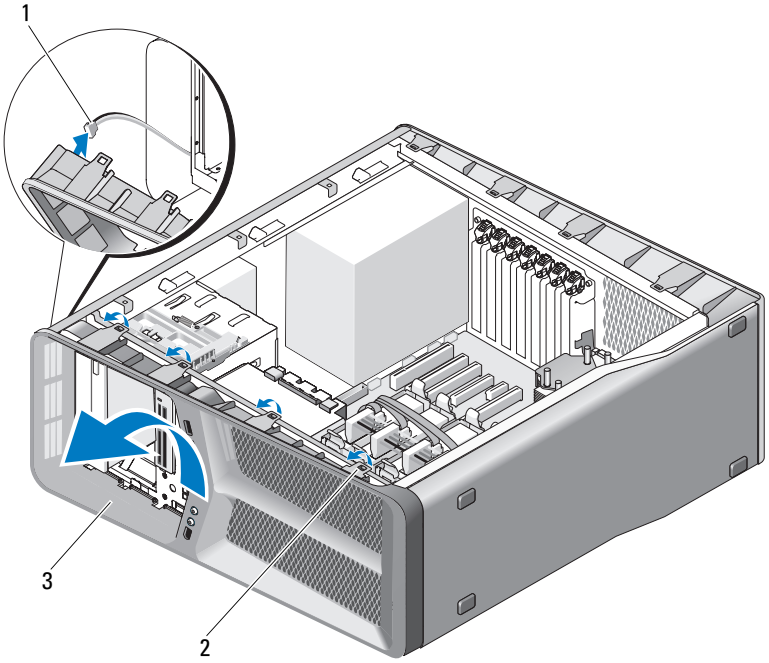
Removing the Front I/O Panel

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Remove any full-length expansion cards (see "Removing PCI and PCI Express Cards" on page 32).

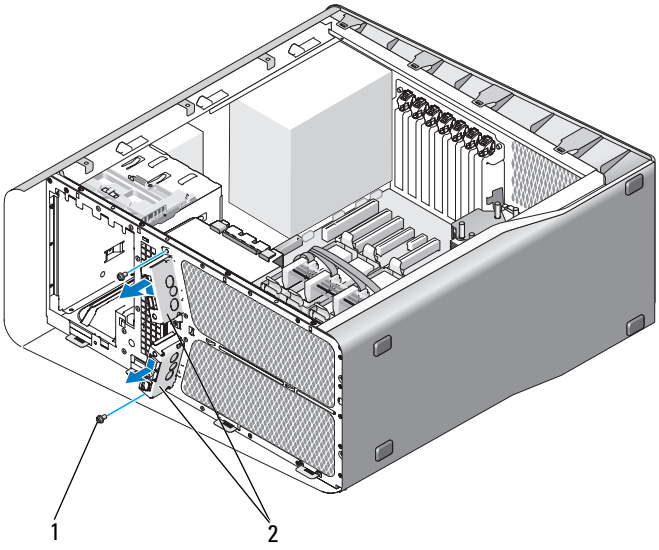
NOTICE: Carefully note the routing of each cable before you disconnect it, so that you are sure to re-route cables correctly. An incorrectly routed or a disconnected cable could lead to computer problems.

4. Disconnect the cables from the master I/O board.
5. Remove the card fan cage (see "Removing the Card Fan" on page 69)
6. Disconnect the FRONT_AUDIO_USB_LED cable, the FRONT_USB_LED cable, and the USB_MB cable from the front I/O panel.
7. Remove the drive panel (see "Removing the Drive Panel" on page 53).
8. Remove the front panel:
   a. Release the four tabs that secure the front panel to the chassis.
   b. Carefully, pivot the front panel away from the computer to release it from the chassis.
   c. Disconnect the FRONT_LED cable from the front panel to remove the front panel.



1	FRONT_LED cable	2	tabs (4)
3	front panel		

9 Remove the two screws that secure the front I/O panel to the chassis, then slide the front I/O panel towards the chassis frame to remove it completely.



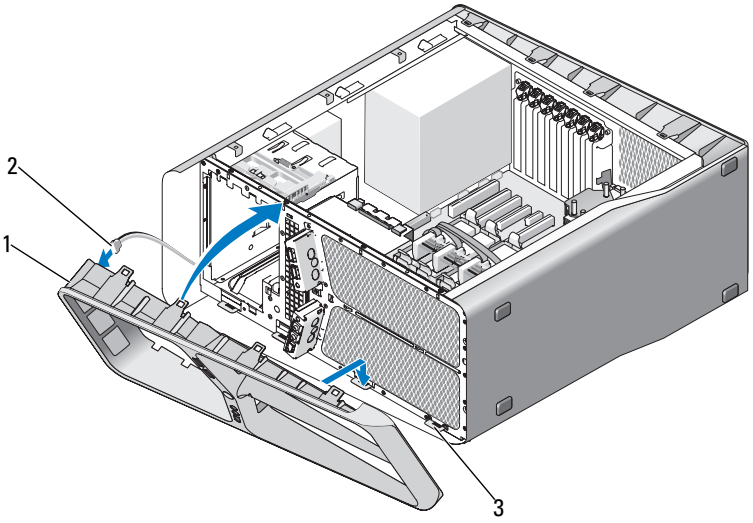
1 screws (2) 2 front I/O panel

Installing the Front I/O Panel

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Align the screw holes on the front I/O panel with the screw holes on the chassis, and then tighten the two screws.

4 Align the securing tabs on the front panel with the corresponding slots on the chassis and connect the FRONT_LED cable to the front panel.



1	front panel	2	FRONT_LED cable
3	securing tabs (4)		

5 Rotate the front panel towards the computer until it snaps into place.

6 Replace the drive panel (see "Installing the Drive Panel" on page 54)

7 Connect the FRONT_AUDIO_USB_LED cable, the FRONT_USB_LED cable, and the USB_MB cable to the front I/O panel.

8 Replace the card fan cage (see "Installing the Card Fan" on page 71).

NOTICE: Ensure that you replace all the cables originally connected to the master I/O board or your computer may not function properly.

9 Connect all the cables to the master I/O board (see "Master I/O Board Components" on page 101).

10 Replace any expansion cards that you removed (see "Installing PCI and PCI Express Cards" on page 35).

11 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

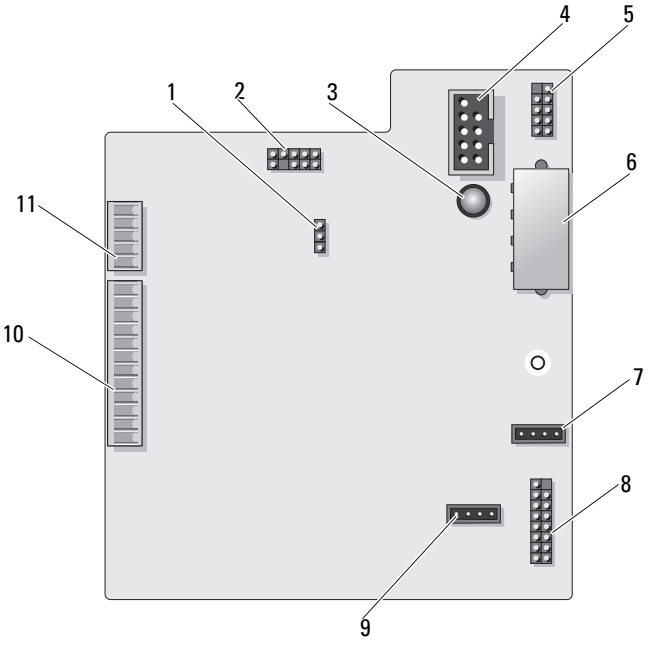
NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into your computer.

12 Connect your computer and devices to electrical outlets, and then turn them on.

13

Master I/O Board

Master I/O Board Components

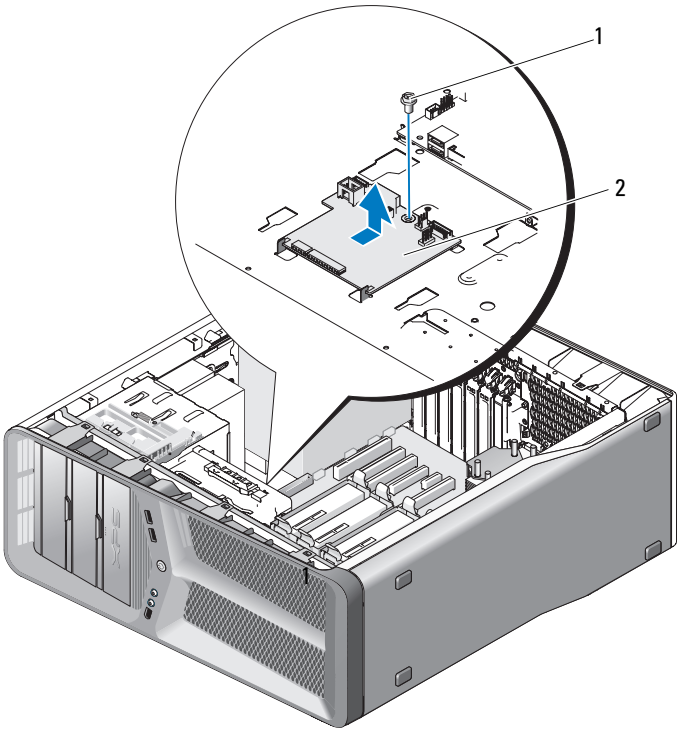


1	I/O board reset jumper (RESET_FW)	2	Slab debug header
3	ESA fault LED	4	media card reader connector (USB_Flexbay)
5	internal USB connector (USB_MB)	6	I/O board power connector (PWR_CONN)
7	card fan connector (FAN_CCAG)	8	rear LED sensor (REAR_LED_SENSOR)
9	hard drive fan connector (FAN_HDD)	10	front I/O panel USB, audio, and lights connector (FRONT_AUDIO_USB_LED)
11	front panel LED connector (FRONT_LED)		

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*

Removing the Master I/O Board

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Remove the card fan cage (see "Removing the Card Fan" on page 69).
4. Disconnect all cables from the master I/O board.
5. Remove the screw that secures the master I/O board to the metal tray.
6. Lift the master I/O board out of the computer.



1 screw 2 master I/O board

Installing the Master I/O Board

1. Orient the master I/O board on the metal tray.
2. Replace the screw to secure the master I/O board to the metal tray.
3. Reconnect all cables to the master I/O board.
4. Replace the card fan cage (see "Installing the Card Fan" on page 71).
5. Replace the computer cover (see "Replacing the Computer Cover" on page 119).
6. Connect your computer and devices to electrical outlets, and turn them on.

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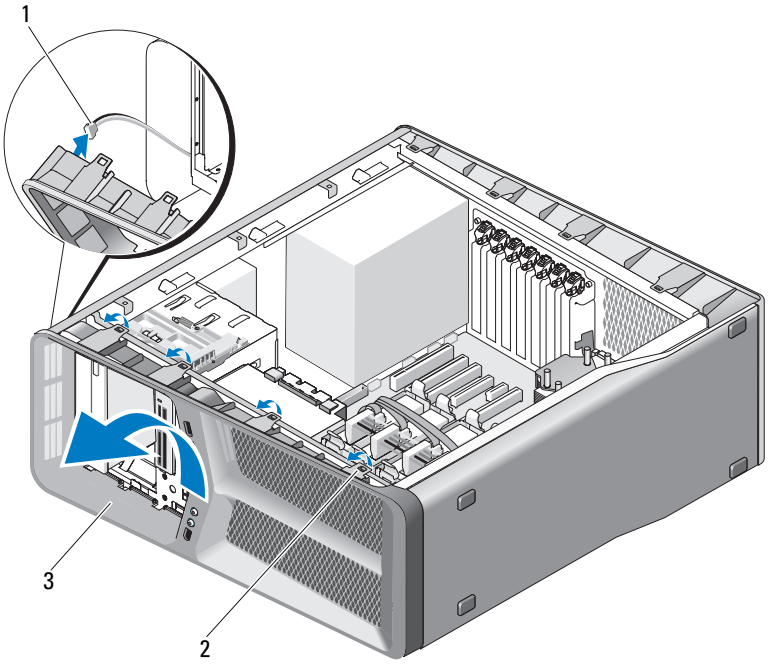
Lights

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*

Removing the Front LED Board

NOTE: The front LED board is embedded on the front panel. To remove the front LED board, you must remove the front panel.

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Remove the drive panel (see "Removing the Drive Panel" on page 53).
4. Release the four tabs that secure the front panel to the chassis.
5. Carefully, pivot the front panel away from the computer to release it from the chassis.



1 FRONT_LED cable
2 tabs (4)
3 front panel

6 Disconnect the FRONT_LED cable from the front panel to remove the front panel along with the front panel light board.

NOTE: Do not remove the front panel light board embedded on the front panel.

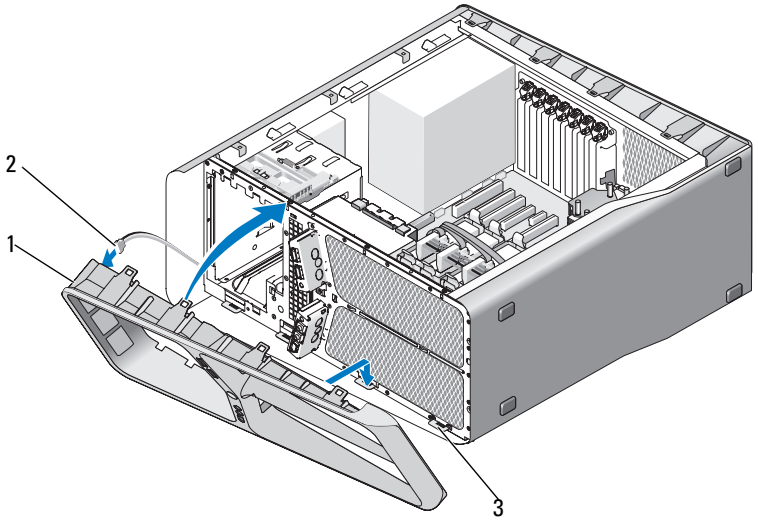
Installing the Front LED Board

NOTE: The front LED board is embedded on the front panel. Install the front panel to install the front LED board.

1 Follow the procedures in "Before You Begin" on page 9.

2 Remove the computer cover (see "Removing the Computer Cover" on page 13).

3 Align the securing tabs on the front panel with the corresponding slots on the chassis; connect the FRONT_LED cable to the front panel.



1 front panel
2 FRONT_LED cable
3 securing tabs (4)

4 Rotate the front panel towards the computer until it snaps into place.
5 Replace the drive panel (see "Installing the Drive Panel" on page 54).
6 Replace the computer cover (see "Replacing the Computer Cover" on page 119).
7 Connect your computer and devices to electrical outlets, and then turn them on.

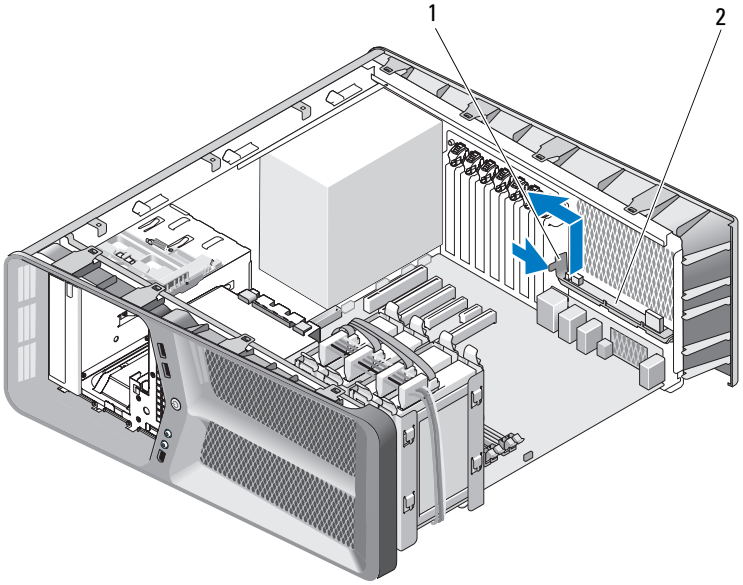
Removing the Rear LED Board

1 Follow the procedures in "Before You Begin" on page 9.
2 Remove the computer cover (see "Removing the Computer Cover" on page 13).

3 Remove the system board (see "Removing the System Board" on page 87).

4 Disconnect the REAR_LED_SENSOR cable from the master I/O board (see "Master I/O Board Components" on page 101).

5 Gently push the release tab away from the chassis to release the rear LED board and then slide it up and away from the computer.



1 release tab

2 rear LED board

6 Replace the system board (see "Installing the System Board" on page 88).

7 Replace the system cover (see "Replacing the Computer Cover" on page 119).

8 Connect your computer and devices to electrical outlets, and then turn them on.

Installing the Rear LED Board

1. Follow the procedures in "Before You Begin" on page 9.
2. Remove the computer cover (see "Removing the Computer Cover" on page 13).
3. Remove the system board (see "Removing the System Board" on page 87).
4. Connect the REAR_LED_SENSOR cable to the master I/O board (see "Master I/O Board Components" on page 101).
5. Route the REAR_LED_SENSOR cable under the system board and replace the system board (see "Installing the System Board" on page 88).
6. Align the rear LED board with the metal tab on the chassis; then slide the rear LED board into place.
7. Replace the computer cover (see "Replacing the Computer Cover" on page 119).
8. Connect your computer and devices to electrical outlets, and then turn them on.

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Replacing the Battery

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

A coin-cell battery maintains computer configuration, date, and time information. The battery can last several years.

If you have to repeatedly reset time and date information after turning on the computer, replace the battery.

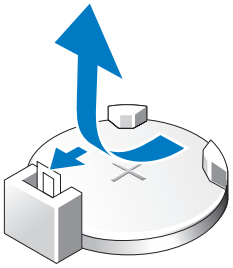
CAUTION: A new battery can explode if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

To replace the battery:

1. Record all the screens in system setup (see "System Setup" in the *Owner's Manual*) so that you can restore the correct settings after the new battery has been installed.
2. Follow the procedures in "Before You Begin" on page 9.
3. Open the computer cover (see "Removing the Computer Cover" on page 13).
4. Locate the battery socket (see "System Board Components" on page 16).

NOTICE: If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, you may damage the system board by prying off the socket or by breaking circuit traces on the system board.

5 Remove the battery by prying it out of its socket with your fingers.



6 Insert the new battery (CR2032) into the socket with the side labeled "+" facing up, and press the battery into place.

7 Replace the computer cover (see "Replacing the Computer Cover" on page 119).

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

8 Connect your computer and devices to electrical outlets, and then turn them on.

9 Enter system setup (see "System Setup" in the *Owner's Manual*) and restore the settings you recorded in step 1.

10 Properly dispose of the old battery. See the *Product Information Guide* for battery disposal information

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Cables

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

NOTICE: Follow the instructions provided in this section while connecting and disconnecting cables inside your computer. Incorrectly connected cables can cause damage to the equipment.

NOTICE: Do not route cables over or behind devices. Cables routed incorrectly can prevent the computer cover from closing properly or cause damage to the equipment.

This section provides information about connecting and disconnecting the following cables from the system board:

- Power cables
- Integrated Drive Electronics (IDE) and floppy-drive cables
- Serial-ATA (SATA) cables
- Front I/O cables

Power Cables

Your computer has two types of power cables:

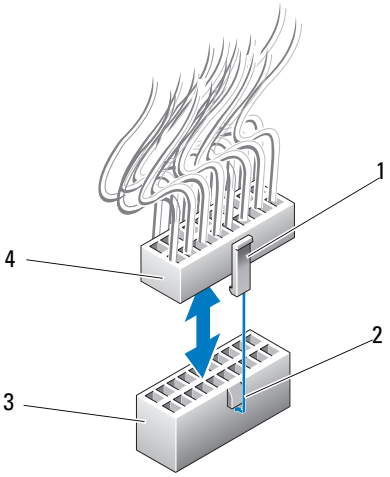
- Power cables with a release latch
- Power cables without a release latch

Power Cables With a Release Latch

The following power connectors on your computer have release latches:

- Main power cable (see "DC Power Connector P1" on page 18).
- Graphics card power cables (see "DC Power Connector P2 and P3 (Graphics Card)" on page 20).
- Processor Power cable (see "DC Power Connectors P15" on page 23).

To disconnect a power cable with a release latch, press the release latch on the power connector and then pull the cable up and away from the system board.



1	release latch	2	tab
3	system board power connector	4	power connector

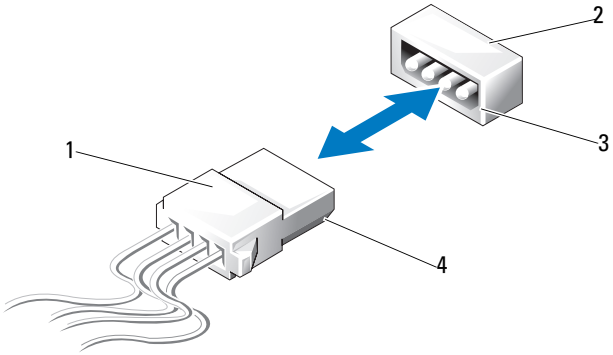
To connect the power cable to the system board, align the release latch on the power connector with the tab on the system board connector; then push the connector downwards until it is firmly clicks into place.

Power Cables Without a Release Latch

The following power cables in your system do not have a release latch:

- IDE drive power cables (see "DC Power Connector P11 and P12 (BAY and BAY2)" on page 21).
- Master I/O board power cable (see "DC Power Connector P14 (MS BD)" on page 22).

To disconnect the power cable without a release latch, hold the cable by the connector and pull it away from the system board or device.



1	power cable without a release latch	2	power connector on the system board or drive
3	beveled edge of the power connector on the system board or drive	4	beveled edge on the power cable

To connect a power cable without a release latch, align the beveled edge on the power cable with beveled edge of the power connector on the drive or system board; then press firmly into the connector.

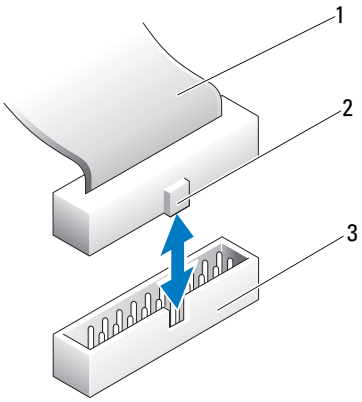
IDE and Floppy-Drive Cables

NOTE: Using one IDE or floppy-drive cable, you can connect a maximum of two devices to each connector on the system board.

NOTE: Floppy-drive cables and connectors are similar to IDE cables and connectors. However, the number of pins on the connectors vary. You cannot interchange the cables or connectors.

To disconnect an IDE cable, hold the cable by the connector at each end and gently pull the IDE cable from the connector on the system board or IDE drive.

The connector on an IDE cable is keyed in the center with a raised piece of plastic called the cable key. To connect an IDE cable, align the cable key with connector on the system board or drive; then push the connector until it is fully inserted.



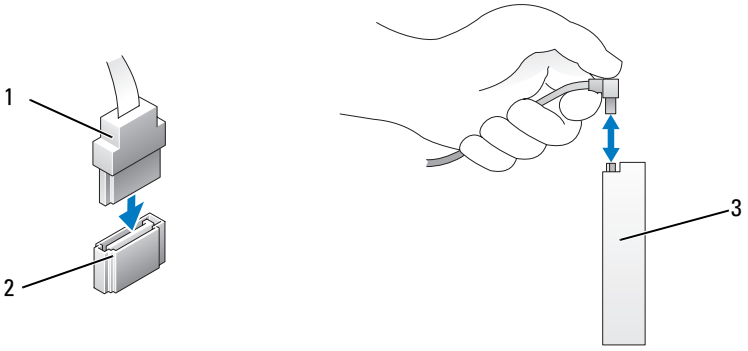
1 IDE ribbon cable 2 cable key

3 IDE connector on the system board/drive

SATA Cables

NOTE: Using a SATA cable, you can connect only one SATA device to the SATA connector on the system board.

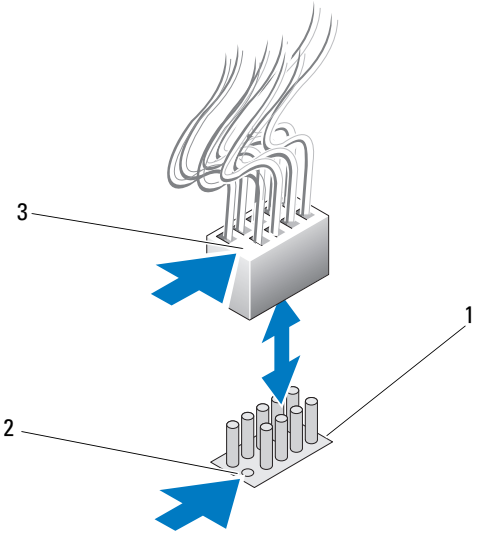
To connect a SATA cable, hold the cable by the connector at each end and press firmly into the connector. To disconnect a SATA cable, hold the cable by the connector at each end and pull until the connector detaches.



1	SATA connector	2	SATA connector on the system board
3	SATA connector hard drive		

Front I/O Panel Cables

NOTE: Most of the front I/O panel, fan, and light cables have similar connectors. The number of pins and the location of the cable key or missing pin may vary.



1	connector on the system board	2	missing pin
3	cable key		

To disconnect the front I/O panel cable, hold the cable by the connector and then pull it away from the system board.

NOTICE: You must align the cable key with the missing pin correctly. Incorrect alignment can cause damage to the equipment.

When connecting the front I/O panel cable, hold the cable by the connector and align the cable key with the missing pin on the system board connector; then press firmly into the connector.

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Replacing the Computer Cover

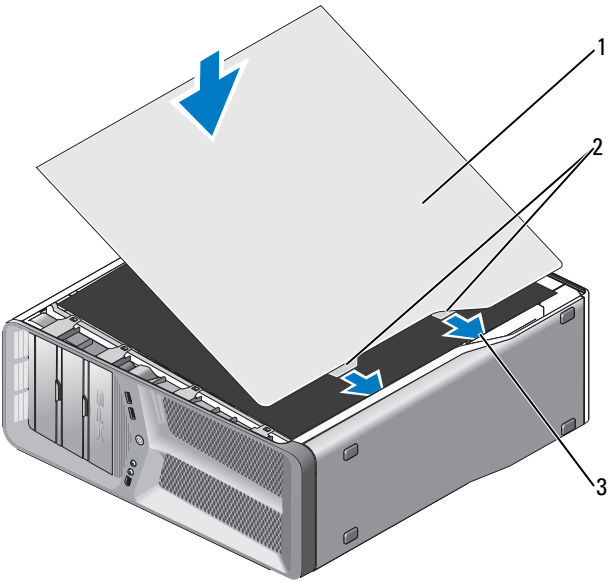
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: Your computer is heavy and can be difficult to maneuver. Seek assistance before attempting to lift, move, or tilt the computer and always lift correctly to avoid injury; avoid bending over while lifting.

NOTICE: To avoid electrostatic discharge and damage to internal components, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface on the computer chassis.

1. Ensure that all cables are connected, and fold cables out of the way.
2. Ensure that no tools or extra parts are left inside the computer.
3. Pivot the cover down and into position.
4. Press down on the cover until it clicks into place.

NOTE: The computer cover should easily snap into place; however, if necessary, pull back on the cover release latch until the cover is completely closed, then slide the release latch forward to secure the cover.



1	computer cover	2	cover hinge tabs (2)
3	hinge slots		

5 With the help of an assistant, carefully set the computer upright.

NOTICE: To connect a network cable, first plug the cable into the network port or device and then plug it into the computer.

6 Connect your computer and devices to electrical outlets, and turn them on.